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President's Address

RETROSPECT ON FORTY YEARS OF PRACTICE

BY

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Some years ago I listened to the inaugural address of a young professor of great distinction, in the course of which he defined the modern specialist and researcher as a man who spends his time learning more and more about less and less, and the modern general practitioner as a man who spends his time learning less and less about more and more. To one who had practised sixteen years before 1914 and twenty-five after that date there was much of truth in this statement, and when I came to consider this address I could definitely place myself in the second category—a person, therefore, who should not attempt anything didactic, concentrated, or illuminating, but rather dilate on some of the topics which engaged my attention in the daily round during forty-one years. I was interested, however, in the researcher and his work, having in the first ten years of my period of practice been a part-time University Assistant in a research laboratory.

The Advance of Medical Research

In pre-war days the most striking results from research in medicine were produced by brilliant individuals working with scant assistance, little money, and very limited time, since nearly all had as their main jobs university teaching and/or honorary hospital appointments which were time-consuming. They invented their own apparatus and in many cases made it. Of this class in our own University of Aberdeen were Ogston (whose mantle as President of the Association, when it last met here in 1914, weighs heavily on my shoulders to-night), the discoverer, in the days of Lister, of the *Staphylococcus aureus*, which he used to describe in his quaint way as a "kindly little creature" compared with the virulent streptococcus—later he became a surgeon of international reputation; Macwilliam, the physiologist, whose classical work on cardiac muscle provided the foundation on which the brilliant clinical work of Mackenzie and Wenckebach was built; Hamilton, a great pioneer in pathology and bacteriology and a brilliant lecturer. All were enthusiastic and able teachers of my student days and stimulators of capable youth to follow in their steps. I shall mention only a few of those that readily occur to me: in surgery—Greig Smith, Scott Riddell, Marnoch, and Henry Gray; in physiology and biochemistry—Leslie Mackenzie, Macleod (the initiator and head of the team which so brilliantly solved the insulin problem), Hugh MacLean, and Lawrence; in pathology and bacteriology—Bulloch, Dean, and Ledingham. The output was small in those days as compared with the present, but the quality was usually very high. Similar work was being done under such circumstances in many of the medical schools of the country. In the post-war period—through the energy and activity of the Press, shall we say?—both patient and practitioner are on many occasions simultaneously informed of the most recent discovery, which is a source of embarrassment to the latter if he does not recognize that the latest knowledge is not always the latest truth. In this period came a greater recognition by the State of the value of research, with a consequent outpouring of money on its behalf, and large sums were given by individuals to endow research and provide Fellowships of generous amount to support brilliant graduates while they pursued their high thinking for longer periods than was possible before. Research is no longer an individual affair as a rule; team-work now prevails, and elaborate equipment and suitable accommodation and skilled assistance are provided. The output has increased and there is earlier publication of results, which in accordance with the spirit of the age has been one of the factors in increasing the number of specialists who can sift the facts of research and assess their applicability to the practice of medicine, and advise and instruct the general practitioner who calls for their assistance in his difficulties. No doubt increased output and earlier publication have necessarily lowered the average of quality, but classical quality is still present—for example, insulin and probably the sulphonamide groups. One need not sigh for the good old days in this regard; for most individuals have more active recollection of the pleasant features of those days than of the bad, and a near knowledge of the disadvantages of the present.

Nutrition

Another subject of vital importance to health—namely, that of nutrition—has had extensive and important contributions made to it by the British Medical Association through its Nutrition Committee. Both by the reports of that committee and by their practical and informative suggestions as to diet and food values, much useful knowledge has been given to practitioners and to the public. The pre-war practitioner can recognize the great improve-

ment in the present-day variety of food, and there is no doubt that much interest has been stimulated by the fact that nutrition has been in the limelight in post-war years, with considerable benefit as a result. There is still lacking, however, in an important section of the population, a practical knowledge of food values and possibly a real knowledge of and interest in cooking. This leads to a diminution in nutritive and reparative value and conduces to the use of canned or bottled foods in increasing amount, even where fresh food is available at cheaper or at least more economic rates from the point of view of health and sustenance. There have recently appeared in our local press reports on the condition of the teeth of school children in country districts. One Education Committee stated that less than 10 per cent. of its school children had perfect teeth, and, extraordinary as it may seem, the only remedy suggested in the report was the appointment of additional dentists. In October, 1914, I took part in the examination of a county battalion of Territorials from the same area, under immediate orders for France. My colleagues and I noted that about 70 per cent. of the men had excellent teeth, a finding which reveals a sad deterioration, in a quarter of a century, in a most important factor in healthy nutrition. Yet there seems to be no need to despair, for I feel sure that the pre-war doctor, from his post-war experience, will agree that there has been great improvement in general health and that it is steadily progressive, with increasing momentum. This opinion is supported by the present Minister of Health, replying to a debate in the House last March, when he spoke as follows:

"A great deal of action has been taken on the newer knowledge of nutrition, and there is a marked improvement in the health of the nation. This country consumes a large quantity of dairy produce. If butter and cheese were counted as the equivalent of milk, the consumption of milk per head in this country has risen from 73 gallons in the five-year period 1925–9 to 89 gallons for the period 1930–4. This figure is higher than that in Italy, Germany, Belgium, France, and the U.S.A. Butter, however, cannot be counted as simply the equivalent of milk; it ranks higher as one of the protective foods. While poverty is a factor in the problem of nutrition it is also true to say that wages have risen and the cost of food has fallen."

He compared figures for 1927 and March, 1939, to show, he claimed, the improvements in the nutrition of the nation. In 1927 the infantile mortality rate was 70, maternal mortality 4.11, puerperal sepsis 1.57, and tuberculosis 79. To-day infantile mortality is 55, maternal mortality 3.26, puerperal sepsis 0.98, and tuberculosis 56.

. Had he been speaking on the same subject to-day he would have been able to introduce rather telling support to the above argument from the reports of Medical Boards on the health and physique of the many thousands of militia in their twenty-first year who have recently been called up for training. One is ignorant, of course, whether and to what extent the standards previously applied to recruits for admission to the Regular Army have been modified, but, even so, the published reports so far point to a great improvement in health and physique. Speaking in a debate on malnutrition in the House of Lords, Lord Hankey—who for nearly a generation, as Sir Maurice Hankey, was secretary of the Committee of Imperial Defence—remarked that when he held that position he was profoundly shocked and humiliated by the fact that more than 50 per cent. of the men offering themselves as recruits for the Army were rejected for physical and medical reasons. He had been assured that the defects which caused the rejections were curable by proper nutrition, but that it took fifteen years to translate research into action.

While public health had improved, much remained to be done. In the schools little was taught about nutrition, and what was taught was mostly out of date. With the weight of the Government behind it there should be a sustained campaign or propaganda on the subject. One must keep in mind that the range of choice of recruits is now the widest possible socially, whereas in the days Lord Hankey refers to, apart from the war years, that range was very narrow. Indeed, in a considerable number of cases the stimulus to join the Army was often *faute de mieux*. However, it would appear that, in spite of some degree of faulty nutrition still, Nature maintains her sway in changed and changing circumstances. After all, food is not the only factor, though the most important one. Improved housing (including workshops), better sanitation, and higher wages; shorter hours of work, giving more leisure, which is gradually being better spent; and greater opportunities for leading an open-air life—all are having their effect on the general health of the people.

A Changed Outlook

To all this must be added the completely changed daily outlook of the industrial population, a considerable part of which in pre-war days, when unemployed from any cause, soon reached a state of threatening semi-starvation. This change of outlook is due to workmen's compensation for accident, national health insurance, unemployment benefit, and other factors, all of which have had effects on our daily work as medical men. The decline of emigration from this country, in spite of the expression of sometimes loud discontent which the freedom of democracy allows, is not, I believe, entirely due to lack of opportunity to enter other countries; it results partly from a definite and widespread recognition of the opportunities offered here for a free and happy life despite the restrictions now being imposed by law and multiplied by the regulations, based on that law, which our bureaucracy determines. As supporting this opinion, one might point to the considerable number of men (and families) who returned to this country during the great slump of 1930 and following years, frankly recognizing that life would be more tolerable here than in the United States and in parts of our Empire over-seas under the prevailing conditions. Does the same view influence in some degree the gradually increasing number of distinguished over-sea medical graduates who come to this country seeking their life-work and often obtaining high appointments? That we welcome them is evidence of our friendliness and hospitality, a matter which we trust will continue to be fully reciprocated in all parts of the Empire. The Englishman—I omit the Scot on this occasion—has an astonishing sense of fair play, but to the observer he sometimes carries this to such a pitch, in economics and in sport as well as in other matters, that he ends by being unfair to himself, with somewhat disappointing results from the point of view of equity.

Attraction of the Hospital

In pre-war days it was by no means easy in these parts for the practitioner to persuade patients to enter our hospitals, even from very mean homes, for observation and treatment. This was greatly changed immediately after the war, and the result has been that nearly all our hospitals have waiting lists of such size as to be a menace to rapid improvement in health and restoration to full fitness for the daily task of many who are on those lists.

To those who know the composition of such lists to the full this menace is perhaps more apparent than real, for many of those waiting suffer from disabilities which do not interfere to a great extent with capacity for work, nor are they progressive in character. What was this increased attraction of the hospital due to? There was undoubtedly a great outpouring of war-accumulated wealth on charitable purposes, and voluntary hospitals benefited early and greatly from this, and as a result improved in their equipment and administration. This, however, was a matter which took time to develop, whereas the snowball of influx to the wards of hospitals and to the outpatient department started almost immediately after the war, when beds were freed of men wounded or ill from troubles contracted on service. Being in general practice and also on the staff of the Royal Infirmary here, both before and after the war, gave me an opportunity of observing this change from a somewhat unusual point of view, at least in a teaching hospital. I came to the conclusion that one of the most important factors in the early and rapid rise in the number of applicants for hospital treatment was the fact that enormous numbers of men and women who under peace-time conditions would have been treated in their homes were during the war treated in hospital. A good many millions were removed from their homes on war service, both at home and abroad. Many were in the Army, Navy, and Air Force; many were in munition and other factories producing war materials in areas far from their homes. When wounded or ill, attendance and treatment was a matter of concern to the State and to employers, because their speedy restoration to health seemed of greater importance than ever before, and controlled treatment such as can best be provided in hospital became the rule.

No country could have done more for those in its service at home and abroad than this country did during the war, and this not least in the direction of providing for the treatment of the sick and wounded. In addition to using voluntary hospital accommodation to some extent, an enormous number of improvised hospitals in halls and schools were created, as well as hutted and tented hospitals all over the country. Removal to hospital therefore was the rule, and the provision of good nursing, good food, and skilled attendance was not only appreciated but enjoyed. On return to civil life these benefits were not forgotten, and it was apparent that the treatment that could be provided in their homes for certain maladies was unfavourable compared with what they had received during the war for similar types of illness; so that not only was there a much readier acceptance of hospital treatment when recommended by the practitioner in attendance but it was very often asked for when there was no real need. I feel confident that this was one of the earliest factors to remove from the minds of many the curious idea that the hospital was a place in which to die rather than to recover.

The Aberdeen Joint Hospital Scheme

The result of all this led to a clamant need for the extension of hospital accommodation. In this town it was recognized early after the war; but many difficulties had to be overcome before our hospitals reached the capacity they now have, and which I hope many of you will take the opportunity of seeing during your stay here. The idea of our Joint Hospital Scheme originated in the brain of the late Professor Matthew Hay, Medical Officer of Health for the city, and was first declared in our Medico-Chirurgical Society (which, I may mention, this year celebrates the hundred and fiftieth anniversary of its foundation) in the year (1920) of the presidentship of the late Sir Ashley Mackintosh, an ardent supporter of the scheme from beginning to end. A committee was formed to pursue this object, with the Medical Officer of Health as an active and inspiring member. The first check came when Professor Hay's successor as M.O.H. declined the committee's invitation to join them. It was decided that to ensure success in the raising of the money it was essential that the leading citizen, the Lord Provost, should take a prime interest in the scheme. In the face of lukewarmness, to say the least of it, on the part of the Public Health Committee of the Town Council, and owing to the fact that Provosts reign for at least three years, it was not until 1927 that Mr. Andrew Lewis (now Sir Andrew), the Lord Provost, in the second year of his office, agreed to undertake the raising of the necessary funds, provided he was satisfied that the scheme had the hearty support of the medical profession. Sir Andrew no doubt acted on his knowledge of the Corporation's intention to take over the Poor Law hospital and convert it into a large municipal general hospital.

Aberdeen Royal Infirmary

Two meetings of the Medico-Chirurgical Society were held, at both of which I was accidentally in the chair. The first took place in a somewhat electric atmosphere, in which much prolonged and contentious argument ensued, revealing more opposition to the scheme than had been expected. The debate lasted almost to midnight, when the meeting was adjourned for a fortnight and then resumed in a calmer atmosphere. Tempers had by then cooled, and the vote in favour of the Scheme was such that Sir Andrew at once took it up. With uncommon wizardry, in the space of two years he collected over £400,000, a very large proportion being provided from the area which the hospital serves and which has a population of about 300,000—a fine achievement.

It is interesting to note that two future kings were associated with this undertaking: King Edward VIII, when Prince of Wales, laid the foundation stone in 1928, and our present King, as Duke of York, along with the Duchess, opened the hospital in 1936. As the hospital neared completion it was found that £100,000 more would be required to free the building fund from debt, and again it was fortunate that the stern occasion produced the man. Lord Provost Watt undertook what was recognized as a very difficult task after the way in which the area had already been drained. Such was his energy and enthusiasm that in one short year he found the money, and his is one of the names which also should be placed high in the Infirmary's roll of service.

Progress of the B.M.A.

This year the British Medical Association holds its 107th Annual Meeting. The number alone indicates persistent continuity in time, and those who know its history recognize a continuity in purpose and in progressive achievement—a tribute to the vision of those provincial men in the town of Worcester who in 1832 founded this Association, and founded better than they knew. This Western Association went east and invaded London; it established itself there as the British Medical Association, changing its name from the Provincial Medical Association to accord with its widening aims. It has since experienced the usual ups and downs of such organizations, in democracies at least; but the up-strokes on the chart of progress have steadily transcended the down, and it

is now holding its Annual Meeting for the second time in this historic city, at its highest peak not only in membership but in influence with the community and the State, its area Empire-wide and its public spirit second to that of no other similar body. In 1914, when the meeting was last held here, its membership was in the region of 22,000; now it is 38,000, showing a remarkable and steady increase in post-war years, a tribute to the sterling character of its work. In these same years, while the membership has increased in numbers, it is also much more representative of all branches of the profession—professorial, consultant, public health, the Services, and general practice. A considerable part of my leisure during forty-one years of practice has been occupied in the work of the Association, and it has been a great privilege and an honour to serve it in various capacities during that time. It is true that the quality of that service has varied owing to the restrictions which irregular demands on his time impose on the general practitioner, particularly if in charge of medical wards and engaged in clinical teaching; but the service has always been interested, making the advancement of the Association its chief aim.

Health and the State

In this country the State was very late in taking a real interest in the promotion of the health of the community. One might say that for long it was more concerned with the protection of property than with the promotion of health, as up till the passing of the Public Health Acts about the beginning of the last quarter of the nineteenth century its interests were mainly confined to the protection of the population against epidemics such as plague, smallpox, typhus fever, and the like; and in their initiation these Public Health Acts dealt more with sanitation and limiting the spread of infectious disease than with measures which promoted health. Thus those who practised medicine at the beginning of this century had few evidences of State control such as exists now. Death, lunacy, and vaccination certificates were a State matter, and, later, notification of certain infectious diseases, for which nominal fees were paid, was a municipal matter; but these were the main contacts of the practitioner with the State and the municipality at that time, so that the professional life of the practitioner was then comparatively untrammelled. No striking change came until that stormy petrel of politics Mr. Lloyd George, then Chancellor of the Exchequer, appeared on the medical horizon with his national health insurance proposals. These were revolutionary in character, and it is not surprising that the profession in the first instance saw itself threatened with a form of control entirely foreign to all its traditions, and on conditions dictated by the State with what was believed by practitioners to be an incomplete understanding of the work involved. It seemed likely, too, that the financial terms for the service which the Insurance Bill was to demand were to be based on the fees accepted by practitioners at that time for attendance on the members of the many Friendly Societies scattered up and down the country to encourage thrift and independence and to provide medical and funeral benefits. The capitation fee paid by these societies was in general very small, but candidates for the post of medical officer were seldom, if ever, lacking, for the cause was considered a good one and worthy of support. Moreover, in the days before the National Health Insurance Act the usual method of starting practice in Aberdeen was to put up a plate and wait for patients to appear—often a long wait. To the young practitioner election as medical officer of a society was a boon; it gave him work on which to build up a reputation and enlarge his experience. The disadvantages, however, were many, among them undignified competition for such posts and no security of tenure. The proposed Act removed many of these disadvantages but promised others of unknown effect.

The B.M.A. and the National Health Insurance Act

It was well for the profession that the British Medical Association existed in 1911, and though its membership probably did not include more than a bare majority of the profession, it was the only organized medical body which could make influential contact with the Government and with knowledge and experience present satisfactorily the views of the profession in regard to the proposed Act. It became the rallying-point of the whole body of general practitioners, and served members and non-members alike during the stormy time that ensued before a satisfactory compromise was effected. It was fortunate that we had good leaders in the Association at that time, able to obtain reasonable conditions of service, as well as reasonable remuneration for the work involved, without penalizing the State. There is no doubt that the success of the Association in its first great contest with the State has been an important factor in leading up to the position it holds at the present day. At the same time one must acknowledge that the prevision of Mr. Lloyd George has been proved and justified by the success of the National Health Insurance Act, and also by the recognition generally that against sickness risks, as against life risks, insurance is a wise policy. Had it not been for the action of the Association on that occasion, however, a seriously underpaid service would have been imposed on the profession, to remedy which would have been very difficult, and such underpayment might have led, in some quarters, to a lack of hearty co-operation, and perhaps to some degree of inefficiency, as bad for the State as for the individual.

On the conditions obtained by the efforts of the British Medical Association a service is being provided which, while still capable of improvement, is favourably comparable with that given in any other country with State insurance. While it is called national health insurance, this is to some extent a misnomer, for democracies seldom, if ever, attain the "national" at one stroke of the pen. Insured members in the various Approved Societies all pay equal contributions, but the benefits given to the sick still vary too much, and this applies also to what are known as additional benefits. In some societies they are all provided, and throughout the whole year; in others they are fewer in number, and often on account of lack of funds are limited to a portion of the year only. This seems as wrong as it is inequitable. Equal benefits should follow equal premiums, and in time the conditions of national health insurance must be altered to this end. But in this country there are two great bugbears against rapid change in this respect: they are voting power and vested interest. One hopes, however, that in this important regard a change in the Regulations will not be too long delayed. From the point of view of the medical attendant, and more so from that of the patient, it is already much overdue. Another point in the administration of the Act which is not "national" is the distribution of the Drug Fund. In England and Wales an expenditure of 3s. per head (not per sick person) of those on the doctor's list is allowed for drugs, while in Scotland the amount is only 2s. "Why this difference?" is a question which is often asked; I cannot say I have ever heard a satisfactory answer given.

Policy of the B.M.A.

The Association has sometimes been, not without sinister suggestion, labelled the most powerful trade union in this country. Not infrequently, in my experience, this arises from its being confused with the General Medical Council—which is a State body—especially at times when the Press records disciplinary action taken by the G.M.C. The British Medical Association, however, differs in its constitution from the accepted definition of trade union in several important respects. Perhaps the most important of these is that in its policy and in its action it never forgets—indeed, one might say it puts in the forefront of its policy—the interests of the community which it is the duty and privilege of its members to serve day and night. It has never advised its members to strike in the trade union sense—that is, to down tools and give no attendance to the sick and injured, an impossible thought which can never materialize. It does, however, advise refusal of service under the conditions and terms offered—a right which is an important plank in the democratic platform, and prevails in all walks of life in this country. It may advise, and often does advise, members not to apply for what it believes to be underpaid posts, mainly because that underpayment will lead to a lack of applicants of the highest qualifications and therefore gives a limited choice. This especially applies to public health appointments, not least, sad to relate, in Scotland, and we had an example of it in a neighbouring county the other day. The attitude of the Ministry of Health in England towards the British Medical Association salary scale compares most favourably with that of the Board of Health in Scotland. These appointments are of prime importance, and it is essential that the best men available should be attracted to them. Again, the Association does nothing to prevent non-members getting appointments, nor does it bring pressure to bear on non-members to become members. After the Insurance Act struggle had passed and the strain and fire of the contest had died down, it was more fully realized how important the action of the Association had been at that time. It rapidly assumed an outstanding position in the guiding of medical affairs in this country and over-seas. This was largely due to wise administration by good leaders, whose devotion to their voluntary duties entailed great sacrifices of time and money, as practically all were engaged in busy practices and had to undertake many journeys to London from all parts of Great Britain and Northern Ireland—sacrifices which their constituents did not always fully realize.

A Time of Stress

In 1931 another event occurred in which the altruism of the profession in regard to State and community was again to be demonstrated, and on this occasion it did not fail to impress the Government of the day. This was the attitude of panel practitioners to the proposed salary cuts at the time of the great slump. To the extent of their panel fees panel practitioners were to be considered Government servants. These fees were not salary in the ordinary sense, but capitation fees which included all out-of-pocket expenses incurred in attending panel patients. Headquarters were assured by the then Minister of Health that the Cabinet had decided that a 10 per cent. cut on all salaries paid by the State was to be made, and that this cut would be imposed centrally. The British Medical Association through its Insurance Acts Committee held a conference in London of panel practitioners, members and non-members alike, representative of all parts of the country, and after a prolonged debate it was decided, with few dissentients, to accept the proposed course on the assurance given.

Parliament, however, did not accept the Cabinet's recommendation. The amount of the cut was not fixed at 10 per cent. all round, nor was it to be imposed centrally in all cases. In many it was left to local authorities to decide the amount of the cut, and in this town some escaped altogether, others had 2½, 5, and 7½ per cent. deducted; on a few only was the 10 per cent. imposed. All panel doctors, however, bore a deduction of 10 per cent. from their fees for attendance on insured patients, and it was imposed centrally. Though there was much argument and much conferring with the Ministry of Health, it was ultimately accepted as a contribution to the National Exchequer in a time of emergency.

Apparently it was not realized, either by the Government or by the public, what this cut really amounted to. As stated above, it was not deducted from a net salary, but from fees which included out-of-pocket expenses, and really represented a cut of about 17 per cent. Little, too, did the public realize that this imposed, through prolongation of the slump, almost intolerable hardship on many practitioners who had large panels and whose practice otherwise was largely composed of the dependants of insured persons. It was a time of unique unemployment, and many practitioners lost heavily in remuneration for their attendance on the dependants of unemployed. So far as I know, no compensation was ever given for such grave losses.

An Effective Force in Promotion of Health

From its foundation in 1832 the Association has been chiefly concerned with: (1) the maintenance of the professional standard of education and conduct (both pre- and post-graduate); (2) promotion of scientific research; (3) promotion of a national public health policy which will allow the profession to make its maximum contribution to the well-being of the country; (4) improvement of efficiency in all branches of medical practice at home and abroad. How successful it had been in carrying out the above aims is shown by the following statement from a leading article which appeared in the *Times* of July 10, 1925:

> "The supreme service which the British Medical Association has rendered to the British nation is its organization of the medical profession as an effective force, able to present its views to Parliament and people. In doing so it has been instrumental in no small measure in directing the health policy of this country."

Its work and attainment since 1925 shows it to be an increasingly effective force in the promotion of the common health, not only in this country but over-seas as well.

The first Medical Act of 1858 was based upon a Bill drafted by the Association, and therefore the Association can claim to have been largely instrumental in establishing the General Medical Council; the direct representatives, too (usually members of the Association), have played their part in moulding and carrying on the work of the G.M.C. Promotion of scientific research was instituted in 1900 at a time when there was great need of assistance in this regard on account of lack of funds for medical research both in universities and in hospitals. For many years the Association has spent annually a thousand pounds in scholarships and grants in addition to the special prizes which have been presented to-night. Numberless committees have submitted valuable reports

on matters connected with the promotion of health, and many of these have been taken up by the Government—usually, however, after years of delay—and incorporated in Acts of Parliament. Of such was the Medical Inspection of School Children Act. Years before the State began to take any great interest in the promotion of health the Council of the Association appointed a committee to collect reports from a large number of medical practitioners on the health of young children. Many thousands were examined voluntarily, and a large number were found to be suffering from the effects of illnesses for which they had never been medically attended, as the parents had not considered these bad enough to require medical attendance. Obviously, however, they were sufficient to lay the foundation of future ill-health, if not serious disability.

On the information supplied a report was drawn up which presented a very strong case—incontrovertible, indeed—for the institution of school medical inspection. This report was presented to the Government of the day, but it was over ten years before the School Medical Inspection Act was passed. It is freely acknowledged that the Act has been of profound benefit from the earlier recognition of ill-health or disability in children, thus allowing earlier treatment to be instituted. There is still lacking in some quarters any proper liaison between the family doctor and the local health authority which administers the Act. Neither State nor municipality yet recognizes or uses to its full value the service which the general practitioner can give and is giving in the way of instruction to his patients on the prevention of disease and the promotion of health. A similar report was issued in 1909 regarding ophthalmia neonatorum, and compulsory notification was strongly urged in that report. This was adopted by the Government in 1914. A long list of similar events could readily be given, but I will mention only one, which was possibly unique because the Association on that occasion was asked by the Government to present a report on physical education.

Our great Association, with its Empire-wide connexions and influence, has in the past played a notable part in the promotion of health, and one feels confident that so long as it continues to attract to its Council men of knowledge, public spirit, wisdom, and vision, its accomplishment in that direction in the future will transcend all its past achievement.

At the last quarterly court of the directors of the Society for Relief of Widows and Orphans of Medical Men one new member was elected, and it was reported as an interesting fact that the candidate was, on his father's side, the great-great-great-grandson of the first president of the society, Sir George Baker, President of the Royal College of Physicians of London, 1785–90; 1792–3; and 1795, who was elected president of the society in 1788, and on his mother's side he had a similar relationship to Dr. Ware, who was elected second president of the society in 1810. A sum of £2,425 was voted for the payment of the half-yearly grants to the sixty-two widows and four orphans in receipt of relief, which is granted only to the widows and orphans of deceased members. Membership is open to any registered medical man who at the time of his election is resident within a twenty-mile radius of Charing Cross. Many applications for relief from widows of medical men have to be refused because their husbands had not been members of the society, and the directors cannot too strongly impress on newly qualified or newly married medical men the advantages that may be obtained by joining the society. Full particulars may be obtained from the secretary at the offices, 11, Chandos Street, Cavendish Square, W.1.

THE PHARMACOLOGICAL ACTIONS AND THERAPEUTIC USES OF SOME COMPOUNDS RELATED TO ADRENALINE*

BY

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LECTURE II: THERAPEUTIC USES

The synthesis and pharmacological investigation of compounds related to adrenaline have been carried out partly with the utilitarian object of finding improved substitutes for adrenaline in its various therapeutic uses. It is convenient, therefore, to examine briefly the established therapeutic uses of adrenaline and to consider to what extent new compounds have replaced or supplemented adrenaline itself or have provided new and independent therapeutic uses.

Actions on the Circulation

Under most conditions adrenaline, intravenously injected, produces a steep and sudden rise of pressure, lasting only a few minutes. It produces a less pronounced rise when given intramuscularly, and usually little or no pressor effect but possibly cardiac acceleration when injected subcutaneously. It is inactive given by mouth. The rise of pressure is due, in the normal animal, mainly to vasoconstriction. The arterioles of the skin, mucous membranes, and splanchnic viscera (except those of the intestine) are constricted. The vessels of the muscles and heart are actively, and those of the lungs and brain passively, dilated. While these statements can be taken as generally true, there seem to be considerable variations in different species of animals in the distribution of vasoconstrictor and vasodilator fibres to different tissues. It is important to remember that adrenaline does not raise blood pressure by general vasoconstriction. It causes, rather, a redistribution of the blood in the direction of increasing the amount in the heart, lungs, muscles, and central nervous system at the expense of the skin and abdominal viscera. The heart rate may be reduced, mainly owing to stimulation of the vagus centre by the rise of blood pressure. When the heart is feeble and the blood pressure abnormally low, cardiac stimulation may play a more important part in the pressor action.

There are some advantages in considering the vascular and cardiac actions of adrenaline separately, though it will be realized that both vascular and cardiac failure may coexist clinically and, even if one alone is primarily at fault, the other will be secondarily involved.

Pressor Actions

The first point for consideration is what value, if any, do adrenaline and related compounds possess in conditions of vascular failure, especially in so-called shock. It is not altogether fortunate that the word "shock" came to be used in its present connotation. The word implies a sudden and violent effect, whereas many cases of shock may be of gradual onset, and further suggests an emotional element which may be absent. In various kinds of bacterial intoxication, or as the result of injuries, burns, operative procedures, etc., circulatory failure is common. In many, probably most, of these conditions the circulatory failure is not primarily cardiac but is due to

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dilatation of the vessels or to diminished blood volume resulting from escape of fluid from the blood, or to a combination of both these factors. The logical treatment for loss of blood volume is infusion with gum saline or glucose solution, or transfusion with blood. So far as vascular dilatation is concerned much evidence goes to show that in these conditions of intoxication the dilatation affects especially the capillaries. Adrenaline acts mainly on the arterioles and is therefore unlikely to be very efficacious in remedying the condition. The transient nature of the pressor effect of adrenaline is also a factor against it, but many related compounds produce far more sustained effects. Here again, however, the latter are unlikely to be of much value unless they act upon that part of the circulation which is primarily at fault. In actual experience drugs of the adrenaline group have been disappointing in the treatment of circulatory failure due to toxins. The pressor principle in pituitary extract is believed to have more effect on the capillaries than adrenaline, and would therefore seem, *a priori,* to be more suitable as a pressor agent in these conditions. Dr. Bazan, working in my laboratory, has recently found that, in the vascular failure resulting in laboratory animals from poisoning with snake venom or ricin, which are allied to bacterial toxins, pituitary extract is more efficacious in restoring blood pressure than adrenaline, ephedrine, or related compounds.

It is pertinent in this connexion to appreciate the fact that the action of toxins is apt to be prolonged and that, once a toxin had attached itself to a tissue, it is with difficulty dislodged. A familiar example of this is that, if an animal receives a bare minimal lethal dose of cobra venom with resulting paralysis of respiration, artificial respiration can keep the animal alive for many hours, but without any sign of recovery of natural respiration. Recovery from the action of toxins is, in fact, generally a slow process, and there is the less hope, therefore, for any substantial gain from the temporary stimulus than can be administered by drugs.

Recovery from the poisonous effects of drugs may be, on the other hand, very rapid. Their action is more easily reversible and they are eliminated more quickly from the tissues; consequently they can be more readily antagonized by drugs which have a transient action. Especially in acute experiments with drugs which produce a profound fall of blood pressure, it is a common observation that adrenaline may restore the blood pressure to normal. Moreover, adrenaline may under those conditions produce a permanent effect by interrupting a vicious circle. As the result of the rise of blood pressure the heart itself, as well as the vasomotor and respiratory centres, receives a better blood supply, and this temporary fillip may be sufficient to maintain the improvement when the primary direct effect of adrenaline has worn off. Dr. Simonart and I (1930) illustrated such an effect in an animal poisoned by harmalol. The dose given arrested respiration and lowered the blood pressure to 10 mm. Hg. After artificial respiration the normal respirations were resumed and blood pressure rose gradually to 30 mm. Hg. An injection of adrenaline then raised the blood pressure to 92 mm., with a coincident increase in the rate and depth of respirations. The rise of blood pressure was continuously maintained for three hours, when the experiment was discontinued. Heymans and Bayless (1937) have recently shown also that, with veritol, in certain experimental conditions the blood pressure once raised stabilizes itself there indefinitely. Conditions of low blood pressure can exist, therefore, though probably of infrequent occurrence clinically, in which a single dose of adrenaline may produce a permanent improvement, so that the brevity of its effects in the normal animal is not necessarily a bar to its employment in certain conditions of abnormally low blood pressure. Nevertheless there are undoubted advantages in using a drug that will directly produce a more enduring elevation of blood pressure, and, as has been discussed in the review of their pharmacology, many compounds related to adrenaline are known to produce a more lasting pressor action than adrenaline, and some have been used therapeutically for this purpose. Of these, ephedrine has been most widely used, especially to combat the fall of pressure that may occur with the use of spinal anaesthetics.

In the comparison given in the first lecture of the action of various compounds on the blood pressure account was taken merely of the net effect on the level of blood pressure. When a more detailed analysis of the action on blood pressure has been made, it has been found that compounds differ not only in intensity and duration of pressor action but in the events that are transpiring during the rise of pressure. Thus Crismon and Tainter (1938) found with different compounds different ratios of the cardiac and vascular components in the pressor action. Moller (1937) states that there are certain fundamental differences between the action of adrenaline and corbasil, especially that the latter dilates the vessels of the kidney and increases the volume of the spleen, whereas adrenaline has the opposite effect in both cases. Other examples could be quoted, but these may suffice to emphasize the fact that the measurement of a pressor effect does not give a sufficient indication of what is the underlying redistribution of the circulation that takes place when adrenaline and compounds related to it raise the blood pressure. Clearly such differences may profoundly influence the therapeutic value of different compounds in different pathological conditions. Little therapeutic discrimination in this direction has so far been exercised. A serious claim has been made for veritol that its pressor action differs from most of the compounds under consideration. It has been extensively investigated by Rein (1937) and others. He finds that the pressor action comes on more gradually than that of adrenaline and lasts much longer, and is accompanied by little action on the heart. Constriction of the arterioles is regarded as being insufficient to explain the pressor action, which is ascribed mainly to a reduction in the amount of blood in the liver, spleen, and venous system. Favourable accounts have been published of its value in conditions of hypotension associated with vascular dilatation—for example, in bacterial infections, surgical shock, etc. I am not able here to enter into a detailed comparison of the possible therapeutic values of various compounds as pressor agents in different conditions. Those values have, in fact, not yet been adequately assessed. What is important is the fact that, if compounds differ in their relative actions upon the heart itself and upon different areas of the vascular bed, the therapeutic potentialities are increased, and further clinical experience may prove that some compounds may be more valuable than adrenaline not only from their more prolonged pressor action but because they have relatively more effect on the venous, or possibly capillary, channels than on the arterioles.

Cardiac Stimulation

Stimulation of the sympathetic nerve to the heart causes acceleration and augmentation of its contractions. Adrenaline produces conspicuously the same effects when perfused through an exsected heart, though in the intact animal these effects may be masked by reflex slowing. The stimulus to the heart muscle given by adrenaline is

a powerful one. I found (Gunn, 1913) that when an isolated mammalian heart was perfused by a solution of chloral hydrate strong enough to arrest the heart in diastole, the addition of adrenaline to the chloral solution could restore the heart's contractions. In other words, adrenaline could antagonize a "fatal" degree of muscular depression of the heart produced by chloral. A similar antagonism was found to exist between adrenaline and chloroform or other heart depressants. Moreover, when an exsected mammalian heart was kept in cold storage for over twenty-four hours and subsequent perfusion with oxygenated Locke's solution at blood temperature failed to initiate cardiac contractions, these began immediately when adrenaline was added to the perfusing solution. With Chavasse I found also (Gunn and Chavasse, 1913) that isolated rings of the cardiac portion of the superior vena cava, which showed no signs of spontaneous contraction, could be made to beat rhythmically on addition of adrenaline to the Locke's solution. Hering (1906) had previously shown that stimulation of the cardiac sympathetic nerve can cause the quiescent heart to beat again.

Such experiments suggested the possible value of adrenaline (*a*) as a stimulant to cardiac muscle depressed by drugs or other agents, and (*b*) (what is not necessarily the same thing) as an agent to restore rhythmic contractility to an arrested heart. In an attempt to estimate its value for such purposes Martin and I (1915) did experiments to determine whether it was efficacious in reviving a heart arrested by chloroform, and, after standardizing a method of doing massage and artificial respiration, found that when such measures alone failed they were frequently successful when combined with adrenaline. Some of the factors which seem to be important for success in resuscitation, when the heart is actually arrested, I have discussed previously in this *Journal* (Gunn, 1921).

The question arises whether any of the compounds related to adrenaline would be more suitable than adrenaline itself as cardiac stimulants either when the cardiac muscle is depressed or when the heart has actually ceased beating. Experimental evidence on this point is unfortunately meagre. Many of the compounds mentioned in the table included in the first lecture produce augmentation and acceleration of the isolated heart comparable in quality to the effects of adrenaline. Generally the onset is slower and the effect less intense but more enduring than that produced by adrenaline. We found (Epstein, Gunn, and Virden, 1932), for example, that the methoxy-phenylethylamines produced a pronounced and prolonged stimulation of the isolated heart.

In the previous section dealing with the pressor actions of these compounds it has been pointed out that they differ in the ratios of their cardiac and vascular activities. Veritol is said to have little action on the heart. Hildebrandt and Mügge (1931) have urged a caution against use of ephedrine as a stimulant in collapse owing to its irregular and poisonous action on the heart. It seems probable that further pharmacological and therapeutical investigations may discover a better cardiac stimulant than any at present in use. Though no compound promises to be more effective than adrenaline in starting an arrested heart, adrenaline has its drawbacks. The sudden steep rise of pressure may throw too great a strain upon a weakened heart muscle. Its direct action is brief but (though this depends partly upon the dose) fulminating. It is reasonable to suppose that better results might be obtained with a compound which has more gradual and permanent but less intense action, both on the heart and on the vessels, than adrenaline. Possibly in resuscitating the heart it might be an advantage to use adrenaline to start the contractions, and to follow this up with an intravenous injection of one of the compounds which have a more prolonged but less intense action. There is scope for further pharmacological and clinical investigations on this point.

Local Vasoconstriction

Adrenaline has been extensively used as a vasoconstrictor in conjunction with local anaesthetics. Probably the original reason for this was to limit haemorrhage, but the intense vasoconstriction produced by adrenaline performs other functions. By slowing down the local circulation it delays the absorption of the local anaesthetic and prolongs the anaesthesia. For example, Stockton, Pace, and Tainter (1931) found that, whereas a 1 per cent. solution of procaine alone produced local anaesthesia lasting seven minutes, the same solution containing adrenaline 1 in 100,000 produced anaesthesia lasting fifteen minutes, and with adrenaline 1 in 25,000 the anaesthesia was prolonged for 230 minutes. The delayed absorption of the local anaesthetic produced by the vasoconstricting action of adrenaline is believed to have two other effects. As the escape of the anaesthetic into the general circulation is delayed, a smaller amount of the anaesthetic is necessary to produce an equal amount of anaesthesia, and the toxicity of the anaesthetic is reduced because a longer time is given for its excretion in proportion to absorption.

One general disadvantage of adrenaline for this purpose is that it is so highly toxic if it should accidentally gain entrance to a vein. There may be a special disadvantage when it is used with cocaine. As a basis for comparison with compounds related to adrenaline, I suggested to Dr. Gurd that he might do a control experiment to see whether adrenaline lowered the subcutaneous toxicity of cocaine. He found, somewhat to our surprise, that, of a group of mice each of which received a dose of 0.15 gramme per kilogramme of cocaine, 33 per cent. died; of a group which received the same dose of cocaine plus 1 in 10,000 adrenaline, 100 per cent. died. The same quantities of adrenaline alone produced no lethal effects. It is well known that cocaine potentiates the pressor and other actions of adrenaline, and it may also potentiate the toxic action. It does not equally potentiate the action of other local anaesthetics. So far as cocaine specifically is concerned, it would seem rash to assume that a combination of cocaine and adrenaline is necessarily less toxic than cocaine alone. This may be true of certain dose combinations but not of all.

Various compounds related to adrenaline offer certain advantages over adrenaline for combination with local anaesthetics—for example, more prolonged vasoconstriction, less toxicity, absence of potentiation with cocaine, and greater stability so that they can be sterilized by boiling. Naturally, in so far as they are less active than adrenaline, they have to be used in higher concentrations. Among the substitutes used for this purpose are ephedrine, metasympatol, corbasil, and propadrine. A sufficient range of controlled comparative experiments has not yet been done to enable a decision to be made as to which is the best vasoconstrictor for use with particular local anaesthetics. It is an important practical problem which merits further investigation.

Ecbolic Action

In the previous lecture the pharmacological actions on the uterus of adrenaline and various other compounds were considered. Adrenaline was early suggested as a remedy for post-partum haemorrhage, and this was justifi-

able on the pharmacological evidence in so far as no exception was then known to the rule that adrenaline stimulated the pregnant uterus. When Gunn and Gunn (1914) found, however, that in both the rat and the guinea-pig the pregnant uterus, whether exsected or *in situ*, was powerfully relaxed by adrenaline, this at once raised the question whether the pregnant human uterus was relaxed by adrenaline, as in that case the administration of adrenaline for post-partum haemorrhage would do more harm than good. To get some evidence of the reaction of the human uterus I investigated (Gunn, 1914) the response of strips of the exsected human uterus and of the Fallopian tubes, and found that adrenaline produced contraction of both. Rübsamen and Kligermann (1912) had previously recorded the same result by similar methods, though I was unaware of their paper when I did my experiments.

Only scanty evidence is available of the action of adrenaline on the human uterus *in situ*. Bourne and Burn (1927) found that, in women during labour, adrenaline produced a slight relaxation of the uterus. As both Rübsamen and Kligermann and I had used unnecessarily high concentrations of adrenaline, I thought that possibly this difference in response between the exsected uterus and the uterus *in situ* might be due to the higher concentrations in the former case. I got Maclachlan to re-investigate this point, but he found that the lowest concentrations of adrenaline that produced any effect on the isolated human uterus caused contraction. At the moment this is difficult to reconcile with the opposite effect found by Bourne and Burn in the human uterus *in situ*. In any case adrenaline itself is not a very promising ecbolic, because its action is transient (even if motor) and the accompanying rise of blood pressure would aggravate haemorrhage.

Some of the related compounds, however, produce a more prolonged contraction of the uterus with a coincident smaller rise of blood pressure, and they are, relatively to their action on the uterus, less toxic than adrenaline. Moreover, many of them have a far wider range of stimulation of the uterus in different species of animals and under different functional conditions than has adrenaline, and would presumably be more certain of stimulating the human uterus. Tyramine seems to be the only one which has been tried clinically, and with rather conflicting results. Actually there are other compounds more promising than tyramine on the pharmacological evidence, and it is not impossible that one of these may yet be found to be a satisfactory uterine stimulant in the human subject.

Action on the Bronchi

Since its introduction for this purpose adrenaline has been extensively used in spasmodic asthma to relax the bronchi. It is usually given hypodermically, and often small doses suffice. It is effective in a high proportion of cases and acts promptly. Administered hypodermically, it has little effect on blood pressure, but not infrequently causes palpitation or precordial distress and occasionally symptoms of collapse. The chief drawbacks to it are the brevity of its action and the fact that it must be given by injection. Up to the present time its most serious rival among the related compounds has been ephedrine, which has the merit of more prolonged action and of being effective by oral administration, a fact which is of especial value in the treatment of children. It is generally agreed, however, that ephedrine is less effective in a severe acute attack of asthma and that it is less certain in its action than adrenaline. It is often valuable as a prophylactic. As a prophylactic in nocturnal asthma its value is diminished by its tendency to produce insomnia, due both to its pressor effect and to its stimulating action on the central nervous system. The ideal anti-asthmatic is not yet to hand, and theoretically it ought to be possible to find within this group of compounds one which could combine the merits of adrenaline and ephedrine with less of their disadvantages—for example, a compound which would be active by oral administration, have a more prolonged action than adrenaline and a more certain action than ephedrine, but be devoid of the latter's stimulant action on the central nervous system. Progress in this quest has been hampered by the difficulty of establishing reliable pharmacological methods of measuring bronchial reactions (difficulties which have been discussed by Handovsky (1935) and others), and also, from the clinical side, by the difficulty of assessing the value of a remedy in asthma, the attacks of which are so variable in onset and in which effects of suggestion, often temporarily effective, are sometimes only with difficulty eliminated.

As is perhaps to be expected from the experimental difficulties, there is much conflict of opinion in regard to the action of compounds on the bronchi. The effect of ephedrine varies considerably, according to the species of animal used as well as to the condition of the bronchi in a particular animal. This explains part of the discrepancy in the pharmacological results obtained with it. Ephedrine is believed to cause shrinkage of the nasal mucous membrane even when given by mouth, and it may have a similar effect on the bronchial mucous membrane, which would widen the lumen of the bronchi and might so alleviate certain cases of asthma.

As has been said, there is reason to hope that more reliable and satisfactory anti-asthmatics may yet be found within this group of compounds. Such claims have in fact been made for some of them, but these claims have as yet been scarcely sufficiently substantiated.

Stimulation of the Central Nervous System

It has already been shown that a stimulant action on the central nervous system, which is not exhibited by adrenaline, is conspicuously possessed by compounds which have an isopropylamine side-chain and which have the benzene ring of the nucleus either unsubstituted or with methoxy or methylenedioxy groups in the 3:4 position. To this series of compounds belong ephedrine and benzedrine. The stimulant action affects mainly the motor cortex and the respiratory centre. One therapeutic indication for such compounds is their possible value as antagonists to hypnotics and anaesthetics, for which their pressor action might be an additional asset. Such an antagonistic awakening action of ephedrine was early shown by Chen and Schmidt (1924) and others against hypnotics like chloral, and a stimulant action on the respiration was also observed in morphine poisoning. It was found that benzedrine is a more powerful stimulant than ephedrine, and estimations have been made of the relative efficiency of ephedrine and benzedrine compared with other well-known stimulants such as picrotoxin, cardiazol, coramine, and strychnine, in antagonizing overdoses of central depressants.

Various hypnotics, though they agree generally in depressing the central nervous system, differ considerably from one another in degree, duration, and site of action, and the analeptics mentioned above differ in these respects even more. Consequently it is not surprising to find that each analeptic has different antagonizing values to different depressants. Many investigations of this type of

antagonism made by a number of workers lead to the conclusion that the curative value of a particular analeptic varies with (*a*) the particular depressant used, (*b*) the dose of it, and (*c*) the species of animal employed (Hildebrandt, 1936). This being the case it is difficult to arrange analeptics in an order of merit that would apply generally to all depressants. Moreover, the variability in different species of animals urges caution in assuming that the results obtained especially in one species of laboratory mammals will be duplicated in man.

Barlow (1935) found in an extensive series of experiments that in rabbits poisoned with pentobarbital, chloral hydrate, and avertin the most successful stimulants were picrotoxin, cardiazol, and ephedrine in that order. Chakravarti, quoted by Burn (1939a), similarly found that picrotoxin and cardiazol could reduce the mortality of mice poisoned with nembutal, whereas benzedrine and ephedrine failed, though the latter were effective respiratory stimulants and, especially benzedrine, had a powerful awakening effect. Raginsky and Bourne (1931) showed that, both in dogs and in man, rectal anaesthesia with avertin could be interrupted or shortened by ephedrine. The data at present available from these and similar experiments are insufficient to assess the value of members of the adrenaline group as antidotes to narcotics. The pharmacological evidence rather suggests that they will be inferior to picrotoxin or cardiazol: but possibly in cases of poisoning with narcotics in man the best results may be obtained by symptomatic treatment, if necessary with a combination of drugs, using those which especially stimulate the cortex, respiratory centre, or circulation, as these systems may seem individually to require them.

The stimulant action of these compounds has been used also in pathological states of nervous depression. This began with the employment, by Prinzmetal and Bloomberg (1935), of benzedrine in the treatment of narcolepsy. Solomon, Mitchell, and Prinzmetal (1937) found it useful in post-encephalitic Parkinsonism, where it produced a subjective feeling of increased energy, diminished tremor and rigidity, and frequently caused disappearance of oculogyric crises. Ephedrine they found far less effective. Davidoff and Reifenstein (1937) gave a good résumé of the uses of benzedrine in depressive conditions and of various undesirable reactions that may occur with it. In the last few years many reports have been published of its therapeutic values and limitations in nervous diseases, including a recent one in this *Journal* (Anderson, 1938). The main result of these investigations has been to show that benzedrine is of some value in narcolepsy and Parkinsonism and in the milder types of depressive neuroses. Caution is urged against its use in cases of cardiovascular disease, and most authors emphasize that it should be given only under strict supervision.

At present it would seem that benzedrine may find a limited but not negligible field of usefulness in nervous diseases. As has previously been said, some of the related compounds seem to be even more powerful stimulants than benzedrine, with sites of action very similar to, but not absolutely identical with, those of benzedrine. Possibly one or other of these might be an improvement on benzedrine for the treatment of nervous depressions, but it is not reasonable to expect that they would have any much wider sphere of usefulness than that drug.

Action on Voluntary Muscle

Originally, as the result of an accidental observation, it was found that ephedrine produced an improvement of muscular activity in cases of myasthenia gravis, and it has had a considerable use in this disease in recent years. While the effect was beyond dispute, it was unknown whether it was due to a central or to a peripheral action. The only evidence in support of the latter was the observation by Kreitmair that strong solutions of ephedrine produce a slight improvement in the contractions of the frog's gastrocnemius. An important contribution to this problem has quite recently been made by Burn and Bülbring (1939b), who have found that in a cat in which the sciatic nerve had been repeatedly stimulated until fatigue occurred an injection of ephedrine produced a large and prolonged rise of tension of the muscle. They found tyramine twice, and dihydroxyphenylethylamine twenty times, as strong as ephedrine, and suggest that these compounds should be tried in myasthenia gravis. The action of the latter substances is described as prolonged, which is rather surprising in view of their relatively brief actions on blood pressure. In a disease like myasthenia gravis duration of action is of almost more importance than intensity. In any case these experiments of Burn and Bülbring are not only explanatory but have suggested experimental avenues by which compounds superior to ephedrine in myasthenia gravis may be discovered.

Among other organs which these compounds have been used to influence therapeutically may be mentioned the bladder. The effect of sympathetic stimulation on the bladder varies somewhat in different animals, but the most general effect is relaxation of the detrusor muscle, with contraction of the sphincter and trigone. Such an action would lead to retention of urine, and gives an explanation of the beneficial effects from the use of ephedrine in the treatment of nocturnal enuresis in children. In this condition the wakefulness produced by ephedrine is a disadvantage. It can be mitigated by small doses of phenobarbitone (Brookfield, 1935), but it would seem possible that other compounds might be found to possess the same action on the bladder without the stimulant action of ephedrine on the central nervous system. This action of ephedrine, which is of therapeutic value in nocturnal incontinence, is often a drawback to the use of ephedrine in other conditions in which it may produce an unwanted difficulty in micturition.

Myerson and Ritvo (1936) observed that benzedrine orally administered produced relaxation of the smooth muscle of the gastro-intestinal tract, and greatly facilitated *x*-ray examination, making differential diagnosis between functional and organic spasm more certain. They found it useful in spastic colitis and pyloric spasm. The stomach emptied itself more rapidly under the influence of benzedrine owing to the relaxation of the pyloric sphincter. This action of benzedrine is rather surprising, as sympathetic stimulation in most animals produces contraction of the pyloric sphincter and relaxation of the fundus, and is in direct contrast to the action of ephedrine, which was found by van Liere, Lough, and Sleeth (1936) to delay the emptying of the stomach in man. In these circumstances it is difficult to predict whether any of the other compounds might be superior to benzedrine for relaxing gastro-intestinal spasm. The question would have to be decided by experiments in man.

Adrenaline has been recommended for the arrest of haemorrhage in gastric ulcer, from its local action in constricting the arterioles. Underhill and I (1914) found that, in contradistinction to its action on the main muscle of the gastro-intestinal canal, adrenaline constricted the muscularis mucosae, and we suggested that benefit resulting from adrenaline in gastric ulcer might be partly due to this action, which might aid in arresting capillary haemorrhage. The use of adrenaline itself in gastric ulcer

has not gained much acceptance, though some still claim beneficial effects from it if given in sufficiently large doses. None of the other compounds has, to my knowledge, been tried in this condition. It is conceivable that a compound less quickly destroyed than adrenaline and less likely to produce an after-dilatation of the vessels might be more successful in arresting gastric haemorrhage.

Conclusion

In this consideration of the therapeutic uses of adrenaline and of some compounds related to it, it has been possible only to indicate the wide range of potential values of members of this group, and even these indications are not exhaustive. There is scarcely an organ in the body which may not be influenced in one way or other by these compounds, and that not merely by general or local changes in the circulation: they affect not only smooth muscle in all organs but also the central nervous system and the voluntary muscles.

Pharmacological investigation has shown that, with slight changes in the chemical constitution, compounds can be found in which one pharmacological property can be increased and another diminished, whereby not only are the therapeutic possibilities increased but desirable actions can be enhanced and undesirable actions eliminated. Our knowledge of the therapeutic values of these compounds has by no means reached finality. Here and there suggestions have been made as to further explorations which may provide better remedies than those at present in use.

It need hardly be said that it has been possible in these lectures to refer only to a small part of the extensive literature on the subject. If undue emphasis has been laid on those aspects in which I have myself been interested, it is only because one object of the Oliver-Sharpey Lectures is to elicit personal experiences.

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THE CAUSATION OF DELAYED UNION AND NON-UNION OF FRACTURES*

BY

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The healing of a fractured bone is the outcome of several processes in which different tissues and fluids of the body bear their part. It is therefore certain that no single explanation can cover all cases of delayed union or non-union. Probably the most logical method of approaching the problem is to state briefly what takes place in the normal healing of a fractured bone and then consider the factors that may interfere with the desired result.

The Normal Healing of Bone

From a radiographic point of view, when a fracture has taken place the edges of the bones are clear-cut. Provided healing proceeds satisfactorily, in a few days the edges become less definite, presenting an eroded moth-eaten appearance. This erosion may be so great that the actual fracture line itself seems to increase considerably in width. At a later date, which in children may be as early as the tenth or twelfth day, ossified callus is seen to be laid down around the fracture site in the form of a plumber's wiped joint. At the same time it can be noted that the medullary cavity is entirely obliterated with new bone, both at the line of fracture and slightly above and below it. After a period, which may be months, the medullary cavity is re-formed, the excess callus is absorbed, and the cortex is restored to its normal shape and density.

From a histological point of view, when a fracture takes place the space between the fragments is filled with blood, and the neighbouring bone-cell spaces are occupied by bone cells. The periosteum is usually torn across and slightly stripped up from the bone at the edges of the fracture; and there is a tear into the soft tissues, which in the majority of cases include muscles. By the eighth or tenth day the space between the bones is filled with very elementary mesoblastic tissue, which is almost myxomatous at first and later takes the form of fibroblasts. This elementary mesoblastic tissue arises from the marrow cavity, from the Haversian canals, from the endosteum, from the periosteum, and from the mesoblastic tissue which forms the sheaths of the torn muscle bundles—in brief, from all tissues of mesoblastic origin in the area. Collagen fibres form in the exoplasm between the cells, and here also are seen minute blood vessels with walls a single cell thick. From the tenth day onwards calcium and other salts are deposited in the space between the cells. This deposition of salts is probably brought about by the action of the enzyme phosphatase, and it is to be noted that the optimum medium for the action of this enzyme is an alkaline one of *p*H 8.4. At a later date the mass of bone which fills the gap between the fracture ends, which fills the marrow cavity, and which forms the extra-cortical callus is absorbed or remoulded. The new lines assumed by the trabeculae are largely influenced by the stresses and strains put upon the bone.

From a chemical point of view, it is found that if fluid is aspirated from between the fragments on the first day it is largely composed of blood and has the same *p*H

* Read in opening a discussion in the Section of Orthopaedics and Fractures at the Annual Meeting of the British Medical Association, Aberdeen, 1939.

value as blood—that is, 7.4. As the days pass the reaction becomes more acid. In some cases by the fourth day it registers a *p*H of 4.5. Thereafter, until the tenth or twelfth day, the haematoma fluid becomes more alkaline and ultimately reaches a *p*H of 8.2 or more. The acidity of the haematoma is brought about by the exudation of carbon dioxide from the dead and dying cells around, from the lactic acid in the damaged muscles, and from the conversion of blood sugar. The acidity of the haematoma absorbs salts from the bone ends and gives the moth-eaten appearance seen in the radiograph. At certain stages the lactic acid content is fifteen times the normal, and the carbon dioxide, which is more diffusible, is twice the normal. By the tenth day the calcium content has increased to ten times the normal. It seems reasonable to presume that the formation of bone is due to the action of the hypercalcaemic haematoma fluid on the embryonic mesoblastic tissue. Experimental work has shown that the substitution of a hypercalcaemic fluid at an early stage in the healing has led to an unusually early radiographic appearance of callus.

In vitro experiments, carried out by incubating blood, muscle, and bone in sealed-off sterile bottles, show that the chemical content of the fluid in such artificial fracture cavities changes in exactly the same manner as the haematoma fluid abstracted from actual fracture sites for the first forty-eight hours. This observation might be considered conclusive evidence that the chemical alteration in the fluid round the ends of a fractured bone takes place in a sealed-off cavity which has no immediate relation with the surrounding body fluid.

If good reduction is carried out after a fracture a sealed-off chemical factory surrounds the ends of the broken bone and the processes indicated above take place. Anything which interferes with the reposition of the fractured bone, with the chemical activity in the factory, or with the living encroaching walls of the factory will lead to delayed union or non-union.

Causes of Non-union

The causes may be taken to be: (1) gross separation of the fragments; (2) interposition of periosteum or soft tissues between the fragments; (3) lack of immobilization; (4) damage to the nutrient artery; (5) damage to the vessels or nerves of the limb; (6) cessation of growth of reparative tissue of cavity walls through inadequacy of blood content; (7) glandular irregularities and systemic diseases; (8) pathological bone; (9) compound condition of fracture; (10) injudicious operations, metal plates, etc.; and (11) sepsis.

Gross Separation of the Fragments.—When the fragments are grossly separated or overriding union must of necessity be slow, if it occurs at all, as raw areas are not in contact.

Interposition of Periosteum or Soft Tissues between the Fragments.—If soft tissue intervenes between the fragments a pseudarthrosis develops unless the soft tissue is itself destroyed—for example, a small piece of muscle. In all cases the intervening structure should be removed by closed methods if possible.

Lack of Immobilization.—When bone fragments are allowed to move the reparative tissue between is torn. This applies especially to the infinitesimally small new blood vessels which are not strengthened by developed supporting tissue. At the best, this repeated rupture of the blood vessels leads to an alteration of the chemical content of the haematoma, and if union takes place it does so with an excess of callus. At the worst, the haematoma is dispersed into new tissue planes, and scar tissue is formed between the bone ends. It should be noted that too early deep massage and too large injections of local anaesthetic also disperse the haematoma.

Damage to the Nutrient Artery.—The blood supply of an average long bone comes from three sources: (*a*) The nutrient artery supplies the endosteum, the marrow cavity, at least nine-tenths of the Haversian canals, the metaphyseal area, and in most cases it perforates the epiphyseal cartilage to supply part of the epiphysis. (*b*) The periosteal arteries anastomose with the metaphyseal and the nutrient arteries and supply at the most a tenth of the Haversian canals. (*c*) The metaphyseal arteries, arising from the arterial ring of Hunter, supply the metaphysis and the epiphysis and anastomose with the periosteal and nutrient arteries.

If one of these sources of blood is cut off collateral circulations are established from the others, but the time taken to establish these collateral circulations varies considerably. Loss of the periosteal arteries may be compensated for in a week, loss of metaphyseal arteries in ten days to a fortnight, but loss of the nutrient artery cannot be compensated for before a fortnight or three weeks. During that period no embryonic mesoblastic tissue will be formed from the marrow cavity, the endosteum, or the vast majority of the Haversian canals. Therefore, if a fracture occurs in the area of a nutrient artery and involves it, a considerably longer period of immobilization is necessary before the reparative process can begin, and, if this period is not given, delayed union or non-union is apt to occur. The chief example of non-union following neglect of this principle is seen in fractures of the middle of the humerus.

Damage to the Vessels or Nerves of the Limb.—If the main vessels to the limb, or the nerves bearing afferent fibres from the site of the fracture are damaged union is delayed or does not take place. This is probably due to failure of growth of the mesoblastic walls of the chemical factory.

Cessation of Growth of Reparative Tissue of Cavity Walls through Inadequacy of Blood Content.—The growth from the cavity walls may be unsatisfactory if the blood supply is deficient in quality, even though it may be adequate in amount. The deficiency in quality might be due to lack of chemical constituents or vitamins, or a combination of the two. Mineral salt deficiency *per se* is seldom, if ever, responsible for delayed union or non-union of fractures. Petersen adopted Howland's figures for the different stages of rickets—that is, taking the product of the calcium and phosphorus in the blood serum as an index—and tried to prove that a prognostication as to the rate of fracture healing could be made on the same basis. Many investigators have failed to corroborate his findings. With regard to vitamins, a large mass of experimental and clinical evidence shows that if the individual is deficient in vitamin A or B fracture healing takes place in the normal manner, but if vitamin C is deficient, as in scurvy, healing does not take place. In such cases the collagen fibres and embryonic mesoblastic tissue are very poorly formed. In the rachitic type of deficiency non-ossified callus is abundant, but ossification is delayed. My impression is that clinically union is achieved sooner if vitamin C is given as a routine, even in cases where a vitamin C deficiency has not been proved. This is also the opinion of Hertz of Copenhagen, expressed to me in a personal communication.

Glandular Irregularities and Systemic Diseases.—From time to time the administration of one or other internal

secretion has been advocated to accelerate the process of bone repair. Thymic and pancreatic extracts have had very strong advocates, but there is nothing that I have found in the literature on the subject, or have discovered by personal test, that indicates any constant action with such glandular extracts. On the other hand, people who have definite glandular irregularities, such as parathyroid or thyroid deficiencies, may have union retarded thereby, and it is obvious that a restoration of the normal glandular balance will be of benefit in such cases. This is most commonly seen in diabetics, where the giving of insulin makes the healing of bone take place in the normal time. Certain systemic diseases affect the rate of healing of fractures, such as syphilis, scurvy, and active rickets. Union takes place when adequate treatment has been given for these conditions.

Pathological Bone.—Fractures through pathological bone usually do not heal in a normal manner. The explanation is probably that the action of the haematoma cavity walls is interfered with—for example, if the fracture is through a secondary cancerous deposit the great mass of the potential cavity wall is formed by cancerous tissue, which will grow itself instead of forming potential bone. On the other hand, fractures through bone cysts, or even giant-cell tumours, sometimes heal up rapidly and completely with bone, but in such cases we are dealing with cavity walls formed by mesoblastic tissue. Fractures of bones affected by osteitis fibrosa cystica are slow in healing because of the poverty of mineral content of the bones, and in Paget's disease fractures are slow in uniting owing to the lack of mesoblastic tissue in the bone.

Compound Condition of Fracture.—In these the working of the chemical factory is upset because a wall is missing and fluid escapes. The success of the Winnett-Orr method is probably due to the fact that the petroleum jelly pack provides the missing wall of the chemical factory. When the artificial wall is supplied healing takes place behind it on the lines described above.

Injudicious Operations, Metal Plates, etc.—Since an operation on a closed fracture converts it into an open one, all operations must be considered injudicious, unless there is a very compelling indication for their performance. It would seem advisable to delay operation until part of the processes enumerated at the beginning of this paper have taken place. Radiographically, and clinically, the introduction of metal is shown to interfere, in part at least, with bone union. *In vitro* experiments indicate that the chemical changes enumerated as taking place in the artificial haematoma are delayed if metal is introduced with the blood, muscle, etc., in the incubator. The haematoma does not become so acid ; the calcium is not absorbed, etc. C. P. Stewart has suggested that part of this retardation may be due to interference with enzymic action. Stainless steel does not have the disadvantage of other metals in the *in vitro* experiments for at least nineteen days ; but after that time if it is introduced into a new artificial fracture it will produce the retarding effects of other metals. Stainless steel pins for femoral neck pegging should therefore not be used a second time without repolishing.

Sepsis.—While infections of fractures most commonly occur in the compound variety, they sometimes arise in closed fractures by way of an infected blood stream. Delayed union, if not non-union, usually results.

The statements I have made refer only to fractures of the long bones and not to fractures in certain situations, which present particular problems. Also, I would like to emphasize that, while the causes of non-union may be manifold, the vast majority are due to imperfect anatomical reduction and to lack of adequate immobilization.

Summary

The normal healing process of a fracture is considered from different points of view—radiographically, histologically, and chemically—and relevant *in vitro* experimental findings are stated.

Causes of non-union are taken to be failure of the normal process, and are examined under various headings.

TREATMENT OF UNUNITED FRACTURES*

BY

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Although the treatment of ununited fractures follows definitely established lines, one cannot entirely dissociate this from the cause. For instance, if a patient has delayed union or non-union of a fracture, and the Wassermann reaction is positive, an essential preliminary is to prescribe a full course of antispecific treatment. Unless this is done the delayed union may pass to the stage of non-union, and the results of the surgical treatment of this are definitely more uncertain when the constitutional condition has not been recognized and treated. Again, in fractures where local sepsis has been present the surgeon should inquire as to the nature of this. It is important to know whether the wound healed with or without severe constitutional symptoms and whether there have been "flares" or recurrence of infection since the primary healing of the wound. After the war my colleague, Mr. A. M. Hendry, reported four cases of delayed gas gangrene. The wounds had been healed for several years, and there was no clinical evidence that these organisms were present in the tissues when subsequent operation on bone was performed. In view of these possibilities I regard it as important that the nature of the original infection should be ascertained, so that the patient may be immunized by sera or vaccine previous to any operative procedure. Even in mild cases it is wise to wait six months after healing of the wound before operating, and in all cases it is safer to excise all scar tissue and remove any foreign body which may be present—before operation to restore continuity of the bone is undertaken.

Another consideration that will influence us in the treatment of non-union is the condition of the limb. Every effort should be made to restore the tone of the muscles and other tissues by massage, physiotherapy, active exercise, etc., as the prognosis, I am sure, is influenced by this.

The next question which arises is the treatment of non-union in cases that are complicated by a lesion of one of the main nerves. This is a problem that was common in war surgery but seldom presents itself to-day. Our experience has been that in cases in which there is a loss of one or more inches of nerve, suture of the nerve should have priority to operation on bone, for two reasons. First, because recovery after nerve suture takes longer than bone union, and, secondly, because the presence of non-union may allow end-to-end suture of the nerve, which may not be possible after continuity of the bone is established.

* Read in opening a discussion in the Section of Orthopaedics and Fractures at the Annual Meeting of the British Medical Association, Aberdeen, 1939.

Method of Treatment

Anyone who reads the literature will be as familiar as I am with the many methods that have been advocated in the treatment of non-union of fractures. From personal experience I am not in a position to assess their relative values: I therefore propose to confine myself to a survey of my own outlook and methods of dealing with this condition. Feeling very sure, however, that active surgical intervention with introduction of foreign material in the treatment of simple fractures has been responsible for many cases of non-union, I must first condemn that method as unwise for the treatment of the established condition. The records of Guy's Hospital show clearly that the method of plating of fractures has lost favour in the home of its birth, and all who work in orthopaedic hospitals see the tragedies to which it not infrequently leads.

As regards the treatment of non-union, the first question that arises is whether union of the fracture will increase the usefulness of the limb, and, secondly, whether surgical intervention is justifiable. We learned during the war that where there was non-union of the lower third of the ulna and ankylosis of the inferior radio-ulnar joint, re-establishment of union of the ulna was a disadvantage to the patient. While the ulna was ununited the movements of pronation and supination took place at this false joint, but unless the inferior radio-ulnar joint was free these movements were lost when continuity of the bone was established. This probably led Baldwin of San Francisco to advocate the operation of production of a false joint in the lower third of the ulna in cases in which destruction of the inferior radio-ulnar joint interfered with pronation and supination. This operation is still recognized as a valuable contribution to orthopaedic surgery.

The question whether operation is justifiable in old-standing cases of non-union is always difficult. I have radiographs and photographs of a postman who was conscripted and was admitted to a military hospital in 1918 with an ununited fracture of the tibia and fibula of eighteen years' duration. He had a fibrous union with practically rectangular posterior displacement of the lower fragments, but walked with a suitable boot without pain. No surgical treatment was advised.

We see many other cases in which operation to reunite the fracture would not be the operation of choice. Let me refer to some of these:

1. *The Old Lady with the Ununited Fracture of the Neck of the Femur.*—If her complaint is difficulty in walking, an osteotomy of the McMurray type would probably be the operation chosen. If it is pain due to an arthritis of the hip or false joint, the question of excision of the head would be considered.

2. *Fracture of the Scaphoid with Some Limitation of Dorsiflexion and Secondary Radio-carpal Arthritis.*—If pain is the predominant symptom, excision of the scaphoid might be the operation of choice, but if limitation of movement is the complaint operation would not be advised.

3. *Ununited Fracture of the External Condyle of the Humerus.*—Owing to the displacement of the fragment following this fracture, non-union is common. The fracture, usually occurring in children, is often associated with increasing cubitus valgus. Movements of the elbow remain free, but in later life the patient may come complaining of an ulnar neuritis. In these cases the non-union of the fracture should be ignored. If deformity is the complaint it can be corrected by an osteotomy of the lower end of the humerus, which might also cure the ulnar neuritis: but if pain is the chief complaint, the operation would be transposition of the ulnar nerve to the front of the elbow.

Cases of Non-union requiring Operation

In some cases removal of the fragments will give the best functional result. I am satisfied that in old-standing cases of non-union of the patella and olecranon removal of bone and re-establishment of continuity of the extensor apparatus is the most satisfactory method of relieving pain and improving function. In cases of pain associated with non-union of the internal malleolus, removal of the fragment is preferable to operation to re-establish union.

Ununited Fracture of the Long Bones

Having dealt with cases of non-union of the long bones in which restoration of continuity was not desirable, and having admitted that I am not familiar with many of the methods advised for the treatment of this condition, I propose to confine myself to the surgical methods which I personally adopt to promote union in these cases. The war taught me that a gap in continuity of bone could only be bridged successfully by means of an autogenous bone graft. We learned that the method established by

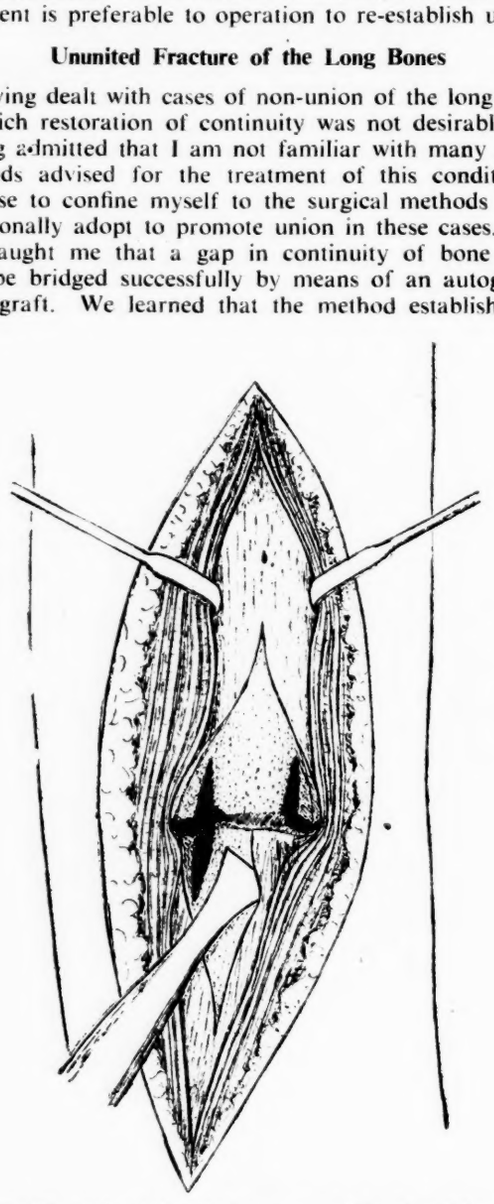

Diagram illustrating subcortical exposure of the site of fracture.

Albee of utilizing a graft consisting of periosteum, cortex, and endosteum, and inserting this into a gutter prepared for it in the correctly aligned receiving bone, would, if given adequate contact and post-operative fixation, result in re-establishment of continuity. I believe that this is true to-day, and where a gap in the bone has to be bridged I regard an autogenous bone graft as essential. I have, however, learned that, in cases in which there is non-union without loss of bone, the bone graft is not necessary to obtain union. This observation is based on experience of the treatment of flail joints during the war. Restoration of stability in the flail shoulder and the flail elbow, where there was much loss of bone, presented a

new problem. In opening a discussion on this subject at a meeting of the British Orthopaedic Association in 1919 I advised that the ends of the bones should be exposed and freshened, not by the usual subperiosteal method, but by removal of cortical bone together with its periosteum and muscular attachments. This left us with the freshened bone surfaces which could be approximated, and also islands of living bone which, when sutured in relation to the joint, increased the area of living bone contact. This experience has entirely altered my method of approach to the surgery of bone, and I have found it of particular value in the treatment of ununited fractures. The principles of the method are:

1. A direct incision to bone.

2. Define the bone outline by means of two light Lane's elevators, inserted subperiosteally about one and a half inches above and below the site of fracture.

3. Expose the fracture by removing bone consisting of a thin layer of the cortex together with its periosteum and muscle attachments intact.

4. Remove the fibrous tissue at the site of fracture and, as the fragments are angulated outwards, raise similar living fragments of bone from the distal side.

5. Open the medullary cavity and make sure that the ends of the fracture are truly freshened.

6. Reduce the fracture and suture the islands of living bone in relation to the line of fracture so that they have contact with both fragments.

7. Maintain fixation of the fracture until consolidation is established.

The following table of twenty-two consecutive cases reviewed for me by my colleagues, F. G. Allan, A. M. Hendry, and R. C. Murray, record the results obtained:

Summary of 22 Consecutive Cases of Non-union Treated by Subcortical Method

No.	Bone	Simple or Compound	Duration of Non-union	Prev. Op. to obtain Union	Graft used	Evidence of Union
1	Tibia	Simple	4½ years	Graft ; wire	No	Clin. and *X*-ray
2	,,	Compound	12 months	No	No	,,
3	Femur	Simple	5 ,,	No	No	,,
4	Tibia	Compound	5 ,,	No	No	,,
5	Radius	,,	8 ,,	No	No	,,
6	Humerus	Simple	5 ,,	No	No	,,
7	Femur	,,	16 ,,	Yes	No	,,
8	Tibia	,,	12 ,,	No	No	,,
9	,,	Compound	18 ,,	No	Yes	,,
10	Radius	Simple	6 years	Plate	No	,,
11	Tibia	,,	11 months	No	No	,,
12	,,	Compound	10 ,,	No	Yes	,,
13	Femur	Simple	8 ,,	No	No	,,
14	Tibia	Compound	18 ,,	Plate	Yes	,,
15	,,	Simple	2 years	No	No	,,
16	,,	,,	15 months	No	No	Clin. (*X*-ray not avail.)
17	Ulna	Compound	12 ,,	No	Yes	Clin. and *X*-ray
18	Humerus	Simple	10 ,,	No	No	,,
19	Tibia	,,	11 ,,	No	No	,,
20	,,	,,	11 ,,	No	No	,,
21	Humerus	Compound	13 ,,	Bone peg	No	,,
22	,,	Simple	11 ,,	No	No	,,

Tibia, 12; femur, 3; humerus, 4; radius, 2; ulna, 1. Total, 22.
Simple, 14. Compound, 8. Previously operated upon, 5. Infected after previous operation, 2. Treated by subcortical method alone, 18. Treated by subcortical method plus graft, 4.

The points to which I would draw your attention in this table are:

1. That the tibia was the site of non-union in twelve out of the twenty-two cases; the others being, humerus four, femur three, radius two, ulna one.

2. Fourteen of the fractures were originally simple, and in five of these previous operation to establish union had been performed. In two of these infection had followed operation. Eight of the fractures had been compound.

3. The duration of non-union varied from six years to five months.

4. In eighteen cases sound bony ankylosis was established by the subcortical method alone. In four cases this was supplemented by the use of a sliding bone graft.

Non-union of the Tibia following Osteomyelitis

Although not strictly an ununited fracture, non-union of the tibia, with deformity and loss of a considerable portion of the shaft as a result of osteomyelitis, has presented an analogous problem. The loss of bone may be so great that adequate contact of an autogenous bone graft is not possible, and the shortening of the tibia could not be overcome by this means. In these cases we have found that by transplantation of the fibula in two stages shortening can be reduced and stability of the limb restored. By operating in two stages we again have the advantage of being able to utilize a graft in which an adequate blood supply is maintained during its transposition.

The ununited congenital fracture of the lower third of the tibia is still to me the most difficult problem, and where the fibula is also ununited I have had no surgical success by any method. In two out of six cases of which we have records, where the fibula was intact, transposition of this bone has resulted in restoration of continuity of the tibia.

Summary of Conclusions

That the Wassermann reaction should be ascertained in all cases of delayed union or non-union of fractures.

That the degree and nature of previous infection should be investigated in cases of compound fracture.

That the question whether restoration of union of the fracture will improve function should have careful consideration. In some cases restoration of union may reduce the functional usefulness of the limb; in others an alternative operation, such as removal of fragments or osteotomy, may be the operation of choice.

That a gap between the bone ends can only be bridged by means of an autogenous bone graft.

That when non-union is present with the fragments in contact, uniformly successful results can be expected by the use of the subcortical method described.

That in cases of loss of bone resulting from osteomyelitis of the tibia, transposition of the fibula by the two-stage method can be relied upon to reduce shortening and restore stability to the limb.

That the results of surgical treatment for congenital non-union of the tibia are very unsatisfactory.

The Eugenics Society announces the following lectures to be held at the rooms of the Royal Society, Burlington House, Piccadilly, W.: Tuesday, October 17, 5.15 p.m., Mr. Alexander Block, "Demographic Aspects of the Housing Problem"; Tuesday, November 21, 5.15 p.m., Dr. C. P. Blacker, "Principles of Eugenic Prognosis"; and Friday, December 15, 5.15 p.m., Dr. Lionel Penrose, "Eugenic Aspects of a Survey of 1,280 Cases of Mental Deficiency."

FOREIGN BODIES INTRODUCED INTO THE BLADDER IN ATTEMPTS TO PROCURE ABORTION

WITH REPORT OF A CASE

BY

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While the variety and number of foreign bodies that have been inadvertently inserted into the female bladder are considerable, it is perhaps strange to find that only a small proportion of these accidents have occurred when the instrument was employed in an attempt to procure abortion.

Tcherlok analysed all cases from the literature between 1910 and 1929 of foreign bodies found in the female pelvic organs, and discovered that of forty-six cases where the foreign body had been pushed into the bladder, in only six of these had this happened in an attempt to procure abortion, while masturbation and curiosity accounted for most of the remainder. Of twenty cases in which the foreign body was found in the uterus eleven were cases of attempted abortion. In forty-one cases where the foreign body, having been pushed into the bladder or uterus, had passed from them into the abdominal cavity or the surrounding cellular tissue either at the time of operation or later, the foreign body was in almost all instances an instrument inserted with a view to terminating a real or imaginary pregnancy.

Elongated rigid substances inserted into the bladder usually assume a transverse position because the transverse diameter of the fixed bladder base is the greater. The body is commonly found lying transversely in the retrotrigonal recess, if this is large, but sometimes it may be caught up in a fold of the bladder wall immediately after introduction, and come to lie in a variation of the plane of introduction. Five cases in which a piece of elm bark was used have been reported in detail previously, and in all of these the body has remained undiscovered for some time until its removal suprapubically after calculus formation had taken place, causing symptoms leading to its discovery.

Why the bark of this noble tree should be so popular is difficult to understand. Most authors claim that foreign bodies can usually be removed from the bladder per urethram, but there is no case quoted where this was successfully accomplished when the instrument used was slippery elm. Attempts at removal by means of an operating cystoscope after manipulating the body into the axis of the urethra by means of a suitable forceps might occasionally be possible, but the risk of trauma would be considerable.

In the following case a piece of slippery elm was found before a calculus was formed, and no attempt was made to remove it per urethram, since it was lying transversely over the trigone, and, moreover, the accompanying cystitis was so intense that suprapubic drainage and lavage were considered the only measures likely to effect a rapid cure. This case is of interest in that the patient experienced no pain at all during the manipulations by which the foreign body was pushed through the urethra and because of the untoward events that complicated its removal.

Case Report

An unmarried woman, aged 25, who had had one previous full-term child, attempted to induce abortion on April 10, 1938, by trying to insert two pieces of slippery elm into her uterus. The pieces of slippery elm were about 2½ inches long and as thick as a lead pencil. In trying to introduce them she did not put her fingers into her vagina beyond the introitus. Both pieces disappeared: the operation caused no discomfort. Two days later she experienced an aching pain above the pubes and intense pain on passing water, and frequency of micturition. The next day her dysuria was worse, and frequency was by night 8–9, by day half-hourly. She consulted her doctor, who sent her to St. George's Hospital. On admission, temperature 98.4° F., pulse 84. Per abdomen: mid-line tumour present, rising out of the pelvis to one inch below the umbilicus. Pelvic examination: cervix was soft and undilated and the body of the uterus enlarged to the size of an eighteen-weeks pregnancy; no foreign body could be felt. Examination per speculum did not reveal any evidence of trauma. The urethral orifice appeared normal. A catheter was passed, and a small amount of thick evil-smelling urine was withdrawn which contained large quantities of albumin and pus. A radiograph of the lower abdomen and pelvis was taken, and showed no abnormality except a few foetal bones. Cystoscopy was performed, and revealed an intense cystitis with submucous haemorrhages present all over the bladder and a foreign body encrusted with phosphates and epithelial debris lying transversely over the trigone.

Gas, oxygen, and ether was then administered, and suprapubic cystotomy performed. A finger was inserted and one piece of slippery elm was removed. A large de Pezzer catheter was inserted and the incision in the bladder sewn up around it. Just now the patient's pulse was found to be rising rapidly, and blood was found soaking through the towels on the operating table on to the floor. The abdominal wound was covered with sterile towels, the patient's legs were raised, her vulva cleaned with antiseptic, cleared of blood clot, and manual compression of the uterus was performed for a few moments. The vagina was then tightly packed with one and a half rolls of six-inch gauze. The pulse was now 130 and very feeble. 500 c.cm. of gum saline solution was administered intravenously, together with 1 c.cm. of coramine. The patient rallied somewhat and the abdominal wound was closed rapidly, leaving a small drain in the cave of Retzius. She was kept in the theatre for about an hour surrounded with hot-water bottles, until her condition had improved sufficiently to allow her return to the ward. Six hours later her condition was much better, and under gas and oxygen anaesthesia the vaginal plugging was removed. The cervix admitted the tip of the little finger. The membranes were ruptured and there was no further bleeding; 500 c.cm. of blood was transfused during this operation.

Three days later labour pains commenced, and an eighteen-weeks foetus was born in two hours. There was a slight loss of blood with the birth of the foetus, and during the next hour this loss increased. The patient's pulse was 110 and weak. A few drops of chloroform were administered and a vaginal examination made. The placenta was found protruding half-way through the cervix, but not fully separated. Separation was effected digitally. The uterus retracted well, and there was no further loss. 1 c.cm. of pituitrin was given, followed by a blood transfusion of 500 c.cm. next day. Local uterine sepsis developed during the next few days, and was treated by intra-uterine instillations of glycerin and iodine and 1 gramme of prontosil, t.d.s. The bladder was washed out twice daily with antiseptic solution, and after ten days the suprapubic catheter was removed and a Hamilton Irving's box substituted. Two days later the patient was passing urine normally. Catheter urine examination showed many pus cells, and the urine grew a heavy culture of *Streptococcus faecalis*. Neoket, 2 drachms t.d.s., was now being given. After a month in hospital the patient was discharged to a convalescent home, where she stayed six weeks. A month after this she reported at the out-patient department and was

feeling very fit. Urine examination was negative and the suprapubic wound had firmly healed.

I am grateful to Mr. C. M. Gwillim for the facilities to treat and report this case.

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Clinical Memoranda

A Probable Case of Third Generation Syphilis

The possibility of the transmission of syphilis to the third generation was not readily accepted in England; but Nabarro (1933), by his description of sixteen families in which transmission to the third generation had occurred and of other families in which it was probable if not proved, was able to convince most people. Such cases, however, are not common, and the occurrence of a single case may be worth recording.

CASE RECORD

In this case the mother, an only child, developed interstitial keratitis at the age of 24. It progressed for some time, and was arrested only when anti-syphilitic treatment was given. At this time she had a boy aged 4 and a girl of 2, normal children, and had had no miscarriages. Her husband approached his father-in-law, who, he says, admitted to having had syphilis, for which he had had no treatment. Both parents inquired about the children, but were told that there was nothing to fear. In September, 1938, the boy, now aged 13, developed interstitial keratitis; Wassermann reaction ++. He received N.A.B. 2.7 grammes and bismuth 2.6 grammes, and in December the interstitial keratitis was disappearing, but the Wassermann reaction was still ++. The mother's Wassermann reaction in 1928 was still positive: she had had sulphostab 16 grammes, tryparsamide 20 grammes, and bismuth 16 grammes. She then left London and had no further treatment. When she came under observation in September, 1936, the Wassermann was still positive. The father and sister have negative reactions and show no signs of syphilis. The grandfather died in April, 1936, aged 60, of "myocarditis and bronchitis." There was no suspicion of syphilis; no physical signs suggesting it were noticed, and no serological examination was made. The grandmother is alive, aged 60, but I have not been able to see her. There is no reason to doubt the parentage of the children.

SUMMARY

The existence of third generation syphilis was established by Nabarro in this country.

The diagnosis of congenital syphilis on the strength of positive serological tests made soon after birth is unjustified.

A case of transmission of syphilis to the third generation in a family is described.

I am indebted to Dr. H. C. Maurice Williams, medical officer of health for Southampton, for permission to publish this case, and to Dr. L. H. MacDonald, venereal diseases officer and pathologist to the town, for his help and advice.

Southampton. G. D. PIRRIE, M.B., Ch.B., D.P.H.

REFERENCE

Nabarro, D. (1933). *Brit. J. vener. Dis.*, **9**, 1.

Slowing of Pulse in Acute Appendicitis

The following case is, I think, of unusual interest, particularly in view of the fact that considerable reliance is frequently placed on a rapid and/or increasing pulse rate in the diagnosis of acute appendicitis.

History of Present Illness.—The patient, a man aged 35, was admitted to the Cheltenham General Hospital on December 17, 1938, at 6 a.m. He complained of fairly severe pain situated low down in the right side of the abdomen. The pain had begun gradually about 2 o'clock the previous afternoon. It was at first generalized across the centre of the abdomen, and later settled in the right inferior fossa. It was steady in character and became progressively worse. He vomited several times after midnight. The present history was otherwise negative. He had had no medication before admission to hospital.

Past History.—In 1922 he had osteomyelitis of the right humerus, radius, and ulna, for which operation was done; and in 1926 tuberculosis of the left hip occurred. In 1935 operation was performed for osteomyelitis of the right ulna. On this occasion he was in the Cheltenham General Hospital eighteen days, during which time his pulse rate ranged between 70 and 90. His past history was otherwise negative. There had been no previous attacks of abdominal pain.

Examination (6.30 a.m.).—The patient is a large, well-built man. General condition is good. Face appears somewhat flushed. Complains of fairly severe pain. Temperature 96°, pulse *48*, respirations 20. Head and neck: pupils normal size, equal, react to light and accommodation; tongue slightly coated; thyroid not palpable. Heart: apex in fifth space three and a half inches from midline; sounds good quality; no murmurs; rhythm regular; rate *48*. Lungs: rub left side of chest anteriorly. Abdomen: markedly tender over McBurney's point; moderate amount of rigidity in right lower abdomen. Rectal examination was negative. Extremities: negative, apart from ankylosed left hip and scars in right upper extremity. The white cell count at 10 a.m. was as follows: total leucocytes, 13,600 per c.mm.; polymorphonuclear leucocytes, 84 per cent.; lymphocytes, 14.5 per cent.; large mononuclears, 1.5 per cent.; no eosinophils or basophils. The pulse, taken at half-hourly intervals for four hours before operation, although rising, was never above 64, and for three hours was below 60. The temperature did not rise above 97° before operation.

Operation (12 noon).—A Battle incision was used. There was a small amount of free fluid. The appendix was swollen to the size of one's little finger, and was gangrenous and tense with pus. It was removed and a small drain inserted down to the rectus sheath.

The day following operation the pulse rose to 110 and temperature to 99.4°, but the next day the pulse fell to 90, and thereafter remained between 80 and 90 until discharge on the fourteenth day. Convalescence was entirely uneventful. The blood pressure, which unfortunately was not taken on admission, was 130/85 the day before discharge.

My thanks are due to Mr. O. E. J. McOustra, honorary surgeon to the Cheltenham General and Eye Hospitals, for permission to report this case.

R. S. WOODSWORTH, M.D.,
Late House-surgeon, Cheltenham General and Eye Hospitals.

In continuation of the series of annual reports on juvenile employment issued by the Ministry of Labour, the report for the year 1938 takes the form of an extract from the Ministry of Labour Annual Report for 1938, and includes a general survey of the work of local committees for juvenile employment, courses of instruction for unemployed boys and girls, and the scheme for the transference of juveniles from the special transfer areas. Reference is also made to the regulations which came into force in 1938 for the provision of meals and milk and biscuits to be given in approved cases to unemployed juveniles attending courses of instruction. The report is published by H.M. Stationery Office, price 3d.

Reviews

RELATION BETWEEN INJURY AND DISEASE

Trauma and Internal Disease. A Basis for Medical and Legal Evaluation of the Etiology—Pathology—Clinical Processes—following Injury. By Frank W. Spicer, A.B., M.D., F.A.C.P. (Pp. 593; 43 figures. 35s. net.) London: J. B. Lippincott. 1939.

In view of the great increase in recent years in the incidence of road accidents it has become a matter of great importance to be able to assess the role of injury as a factor in setting up or aggravating various conditions of disease. Dr. Frank W. Spicer sets out in his book *Trauma and Internal Disease* to present the evidence for such an association in a large number of types of case. He points out the unsatisfactory way in which medical evidence may be offered, and the still more deplorable way in which such evidence is perverted by the ingenuity of counsel to serve a client's interest.

The author has collected a most impressive amount of material in the way of reported cases and comments by many writers in the Old World and the New, but there is little evidence of any critical examination of the views thus quoted. The general impression produced by this book is that almost any bodily defect can be brought about by injury, but the evidence for this is often singularly unconvincing. Sometimes this doubt is expressed, as in a passage quoted from Kinnier Wilson, discussing the possible relation of disseminated sclerosis to peripheral injury: "If we dismiss the hypothesis of mere coincidence, we are compelled in fairness to suppose that a latent organic disease was 'precipitated' by a relatively severe peripheral injury, incapable though we may be of framing any reasonable theory as to how such an injury might act." One can imagine counsel cross-examining a witness who first put up a theory of a "latent organic disease" and went on to say that this might somehow have been "precipitated" by an accident. Such an argument would of course fall far short of that degree of proof "beyond all reasonable doubt" which ought to be demanded before accepting a causal relationship as affording grounds for recovery of damages or compensation.

Probably few urologists would agree that "almost every author and writer dealing with renal disease absolutely ignores trauma as a causal factor in the formation of stone in the kidney." On the other hand, a quotation from Clifford Allbutt (written in 1909) would appear to ascribe altogether too much importance to injury as a cause of heart disease: "The harm of a strain is perhaps always permanent, and even if all apparent disability pass away for good, some alteration of texture probably remains. . . . Unless mild and in comparatively young men or boys, severe bodily exercise is probably at an end for life . . . in middle life, the heart is never wholly restored."

In the section dealing with chronic affections of the central nervous system the author seems to be trying to make up for the lack of precise reasoning by an avalanche of quoted authorities. Thus, "Spiller said he did not believe that trauma was ever the cause of syringomyelia, unless the trauma directly affected the spinal column and spinal cord. Cases of poliomyelitis following trauma have been reported by Futer, Stiefler, Behrenroth, Haywood, Mohr, Walter, Woods, and others. . . . Bullard recorded a case of progressive muscular atrophy following a blow on the head. Jeliffe collected from the literature ninety cases of 'the amyotrophic lateral sclerosis syndrome and trauma.'" Soon after this blunderbuss paragraph comes a careful case history by Riddoch describing a bullet wound of the spine, followed by meningitis circumscripta serosa—a condition so clearly set up by injury that one feels that the case is quoted at this point by way of atoning for the foregoing mass of bare assertions of improbable causal relationships.

The book is valuable more for its many case histories and extensive bibliography than for any serious contribution which it offers to the critical examination of the part played by trauma in the causation of disease.

THE FIELD OF PSYCHIATRY

Archives of Neurology and Psychiatry from the Central Pathology Laboratory of the London County Hospitals for Nervous and Mental Disorders. Volume XIV—1939. Edited by Frederick L. Golla, M.B., F.R.C.P. (Illustrated. 15s., postage 9d.) London: P. S. King. 1939.

Another volume of the collected papers of those working in nervous and mental diseases under the auspices of the L.C.C. is before us. Under the editorship of Professor Golla these papers give an admirable survey of the administrative and scientific progress in this country, chiefly in the field of psychiatry. The present series begins with the editor's Maudsley Lecture, in which he defines the limitations of the scientific method as applied to psychiatry, deprecating the atomistic and associational approach of the older psychiatrists, and advocating a holistic attitude which has its nearest counterpart in the Gestalt school of psychology. If this is so pathology can have only a limited scope in psychiatric study, however important and serviceable it may be; and a study of the whole personality and its relation to intrinsic and extrinsic environment, to say nothing of the sense of essential values which the individual has evolved, is absolutely necessary for a proper understanding both of the patient and of the disease process from which he suffers. There follow four papers on administrative and prognostic questions relating to the working of the Mental Treatment Act. The mental effects of head injury are dealt with by Professor Mapother, and a short study of the immediate effects of temporary unconsciousness induced in boxers by complete or partial knockouts is of interest. Genetic studies in Huntington's chorea and on the occurrence of psychiatric disorders in twins are included, while studies of hysteria and psychoses in children by Dr. Creak are well worth attention.

The largest number of papers, as might be expected, are devoted to schizophrenia, especially in relation to shock therapy. There are several papers on electro-encephalography, including Grey Walters's excellent critical review. Mental deficiency is represented by papers on special syndromes, and by an interesting study of the use of acetarsol in the late treatment of congenital syphilis among mental defectives.

Post-mortem findings and the chemical pathology of various conditions are dealt with, but it is obvious that in a short review one cannot even mention the subject-matter of all the fifty-eight papers collected in this volume. Enough has been said to indicate that all scientific workers in neurology and psychiatry should either possess a series of these annual *Archives,* of which this is the fourteenth, or keep them in mind, since within their covers he is practically certain to find some paper that throws light on the particular problem with which he is engaged.

RECENT WORK IN UROLOGY

The 1938 Year Book of Urology. Edited by John H. Cunningham, M.D. (Pp. 472; 163 figures. 2.50 dollars; 10s. 6d., postage 6d.) Chicago: The Year Book Publishers; London: H. K. Lewis and Co. 1939.

The 1938 issue of this yearbook well maintains the high standard of its predecessors as a readable synopsis of world urology, with good illustrations, copious references, and useful indexes of subjects and authors. The importance of haematuria is stressed by the fact that in 798 consecutive patients suffering from it 32 per cent. were found to have genito-urinary neoplasms, 11 per cent. renal tuberculosis, and 16 per cent. lithiasis. There are sane discussions of the dangers, as well as of the value, of the more recently introduced drugs. For instance, the administration of mandelic acid, perhaps one of the least harmful of such drugs, is not infrequently followed by the presence of albumin, casts, and even blood in the urine. As regards the statement that the presence of pus and organisms in the urine is among the outstanding features of renal carbuncle, the opposite is usually the case, except late in the disease.

It is illuminating to find a radiologist advising, and a urologist condemning, routine ascending pyelography in renal tuberculosis; surprising to find a recommendation of aspiration biopsy in renal growths; and comforting that the frequent presence of large dilated veins round a renal neoplasm signifies neither malignancy of the growth nor invasion of the renal vein. One may disagree that in the case of a suspected renal neoplasm urography should, if possible, be ruled out in favour of ascending pyelography. Even if seen clinically early most renal neoplasms are pathologically late, and excretion urography gives obvious confirmation of their presence without the risk, involved in ascending pyelography, of dislodging neoplastic cells into the circulation by pyelovenous backflow. Ascending pyelography can be reserved for cases, such as early ones, where excretion urography findings are inconclusive.

It is impossible to do more than mention a few of the points of this admirable compendium, which should prove attractive and easy reading, not only for the urologist, but also for the general surgeon and practitioner.

THE TOOTHBRUSH

The Toothbrush: Its Use and Abuse. A Treatise on Preventive Dentistry and Periodontia as Related to Dental Hygiene. By Isador Hirschfeld, D.D.S. (Pp. 591; 415 illustrations. 35s. net.) London: Henry Kimpton. 1939.

Readers of this book will be impressed by the enthusiasm the author has for his subject and the great pains he has taken in presenting it in an acceptable form. The toothbrush has been both praised and condemned, but here is an attempt to examine critically the use and abuse of the instrument by placing before the discerning practitioner the accumulated results of observations as an experienced periodontist of its effects upon the condition of the teeth and gums of patients who have come under his care.

The subject is introduced by a historical survey of the means adopted in the past to preserve the teeth and gums in a healthy state. This chapter contains much of interest, although it is salutary to have attention directed to the very slight positive progress actually made in matters of oral hygiene during the past century. The following chapters give sufficiently full accounts of the aetiology of the commoner pathological disorders of the teeth and gums. Dental caries, gingivitis, erosion, and abrasion have their own chapters, and the toothbrush as a prophylactic or therapeutic agent is fully discussed. Parodontal disease, with the baffling contradictory theories about its causation, is fully dealt with, and, while not entirely in agreement with all the author's statements, we must recognize the beneficial results obtained by simple, properly directed methods of use of the toothbrush.

Where appropriate, each chapter contains the case histories of patients exemplifying the various details of special points mentioned in the text, and these are further amplified by the numerous excellent illustrations and the summaries which appear at the end. The methods of using, and the suitability of, the toothbrush, are the subject of several chapters, the study of which makes one realize how wasteful and, in fact, dangerous the so-called cleaning of the teeth can be, how perfunctorily it is often performed, and what benefits could follow its proper accomplishment. Details of how to give instructions to patients are given, and after a discussion of dentifrices, mouth-washes, bleaching agents, etc., the final chapter is devoted to the aetiology of dental caries.

Although the book is rather long it can be read with profit by all who wish to do what is best for their patients, for it deals with a subject which at first sight appears so simple, yet is one on which, when invited to give advice, we find it so difficult to speak with authority.

HUMAN SIRENIFORM MONSTERS

Über die menschlichen sireniformen Missbildungen. By Günter Frädrich. (Pp. 84; 48 figures. R.M. 6.) Jena: Gustav Fischer. 1938.

This monograph deals with the anatomy and genesis of these remarkable monsters. One of its special features is the stress the author lays on the frequent occurrence of defects of development in the upper part of the body in addition to those of the pelvis and lower limbs, which hitherto have received only scant attention or have been entirely overlooked. These include hydrocephalus; microgyria; steeple-skull; arhinencephalus; hare-lip and cleft-palate; atresia of the oesophagus, with or without a tracheo-oesophageal fistula; defective development of the lungs; malformations of the heart and large blood vessels; defects of the alimentary canal; defects or absence of the organs of the urogenital system; defective development of the upper limbs, more especially hypoplasia of the radius with absence of the thumb; defects in the development of the cervical, thoracic, and lumbar regions of the vertebral column such as spina bifida occulta and fusion of vertebrae, accompanied by variations in the number of the ribs, of which it is important to note that although the number is usually diminished, in some cases it is increased—for example, in one there were sixteen ribs on the right side, fifteen on the left. The ribs are, however, often rudimentary or fused, and the upper rib cartilages may not reach the sternum.

The specimens specially examined by the author confirm the observations recorded by previous authors with regard to the main features of the deformities of the pelvic bones, lower limbs, external genitals, pelvic viscera, and the frequent absence of one of the umbilical arteries and of the urachus. Absence of one of the umbilical arteries is, however, not a constant feature, and it is sometimes found in acardiac foetuses.

In discussing the causes of symmelia the author points out that the frequency of a wide distribution of defects in development throughout the whole body indicates that sireniform malformations are not due to any specific local

cause, and that the primary cause begins to act at a very early period of gestation. He refers to various hypotheses which have been put forward in the past and recently, and shows how these in most cases fail to explain the almost universal accompaniment of the developmental defects of the pelvic region and lower limbs by defects which are found in other parts of the body, and that both are due to a general cause which results in primary arrests of development and in certain secondary consequences dependent on the initial failures.

LEPROSY

Leprosy: Diagnosis, Treatment and Prevention. By Ernest Muir, C.I.E., M.D., F.R.C.S. Sixth edition. (Pp. 192; 85 illustrations. Rs. 2.) Delhi: Indian Council of the British Empire Leprosy Relief Association. 1938.

This book, by Dr. E. Muir, the medical secretary of the British Empire Leprosy Relief Association, of which the sixth edition has been published eighteen years after the first, deals, as its subtitle indicates, with the diagnosis, treatment, and prevention of the disease. Since the last edition the book has been considerably enlarged by the addition of sections on the history, endemiology, and bacteriology of leprosy and the inclusion of more numerous and better illustrations.

From the historical section we learn that leprosy was first brought to Europe by the Persian armies and later into Italy and other European countries by Roman soldiers who had taken part in the eastern campaign. According to Dr. Muir, leprosy is a disease which belongs to a certain stage of civilization and to a certain standard of living, and persists longest in those countries where isolation and sanitation have been neglected. As regards the aetiology the most important factors are stated to be "the infectiousness of the infector, the closeness and length of contact, and the lack of resistance of the infectee." A short account of the bacteriology is followed by several chapters dealing with the distribution of the lesions, their clinical and histological features, different types and complications illustrated by numerous striking photographs. The clinical, bacteriological, and histological guides to diagnosis are next considered. In the chapter on treatment a full description is given of the methods of preparation and administration of the various forms of chaulmoogra oil, general management, and surgical measures. The account of prophylaxis includes the precautions to be taken for children and adults, public health measures, propaganda, and village isolation, and the leprosarium. Laboratory tests are described in the appendices.

The book, which is of a thoroughly practical character, will prove of value alike to the public health worker and the practitioner, and though primarily intended for doctors in India can be warmly recommended to all those concerned with leprosy throughout the world.

Notes on Books

Dr. PAUL NIEHANS'S *Die endokrinen Druesen des Gehirns: Epyphyse und Hypophyse* is published in Berne by Hans Huber, price 10.50 Swiss francs. The author is known as an experimental worker in endocrinology, and for his attempts to establish the therapeutic value of heterogeneous endocrine grafts in man. In this somewhat speculative book he reviews our knowledge, or lack of knowledge, of the pineal and pituitary glands. With reference to the former, he writes with apparent sureness on a subject which is admitted by most endocrinologists to be still wrapped in obscurity. He ventures not only to define the effects of hyperfunction of the pineal gland but also to divide this into pre-natal and post-natal. Within the limitations of our knowledge we are unable to agree or disagree. The pituitary chapter follows on relatively more conventional lines, but some surprising statements are made. In general the character of the book is exemplified by a phrase in the introduction, "The formidable influence of the endocrine glands on the spirit and soul. . . ." We believe this book may intrigue some readers, but a drastic criticism prior to publication might have sifted the wheat from the chaff.

A new edition of *The Pocket Book of First Aid in Accidents and Air Raids, including Chemical Warfare,* by Colonel E. M. COWELL, has been published by George Gill and Sons at the price of 1s. The text is written in plain, straightforward English and is completely unambiguous—an exceedingly useful feature in a book of this kind. Good use is made of simple illustrations to drive home important points, and the author's thought for the patient's comfort is shown in his immediate instructions for treatment of fractured clavicle: "Sit the patient down, keep him warm, and give him a hot drink and cigarette." There is a special section on first aid in chemical warfare, and a useful thumb index is provided.

Preparations and Appliances

PREPARATIONS OF STILBOESTROL

We have received from Glaxo Laboratories Ltd. samples of "clinestrol," a name they have devised for their preparations of stilboestrol. Clinestrol tablets contain 1/2, 1, or 5 mg. stilboestrol, and are intended for oral administration. Clinestrol ampoules contain 1 mg. stilboestrol dipropionate and are intended for intramuscular injection.

The manufacturers have compiled a pamphlet which reviews the recent literature on the clinical use of stilboestrol. This compound is being used increasingly as a substitute for the natural oestrins in such conditions as the menopause, senile vaginitis, vulvo-vaginitis of children, and secondary amenorrhoea. The oral dosage suggested for the production of effects of moderate intensity is 0.5 to 1 mg. daily. The cost of the 1-mg. tablets is 12s. 3d. per 100.

EXTRACT OF APPLES

Ivax extract of apples (Boots Pure Drug Co. Ltd.) is a liquid extract of apples free from apple marc. It is recommended for the treatment of infantile diarrhoea. Messrs. Boots provide an interesting brochure giving an account of the literature of apple therapy.

The medicinal value of apples is a matter of folklore in Great Britain, but in Germany apple therapy for diarrhoea was reintroduced in 1929 and has become popular. There is general agreement as regards the success of this method, although the rationale is doubtful. Some authors suggest that the apple acids are the active agents, while others believe that the pectins adsorb bacteria and toxins. Messrs. Boots have found that the apple marc has no effect on diarrhoea, and hence the action is not due to mere bulk and must be brought about by some soluble constituent.

TABLETS OF WATER-SOLUBLE VITAMINS

Priovit (Bayer Products Ltd.) is a tablet preparation of the water-soluble vitamins B_1, B_2, C, and P. Factor P or citrin is believed to act as an adjuvant to ascorbic acid in the maintenance of capillary resistance. The rapid multiplication of the number of water-soluble vitamins is creating new therapeutic problems, since this increase in number increases the probability of the occurrence of multiple deficiencies. The proportion of vitamins in the priovit tablets is based on the known human requirements. They are recommended for use in conditions characterized by increased metabolism and for the correction of vitamin-poor dietaries.

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RETROSPECT

Of late years the presidential address at the Annual Meeting of the Association has tended to take the form of either a forward look at the prospects and conditions of medical practice based upon present-day movements, or a retrospect indicating the changes that have already taken place, with a view to assessing their value and discovering what indications or lessons for the future may be drawn from them. Last year, at Plymouth, Dr. Colin Lindsay considered mainly the relations between the medical profession and the public with the purpose, largely, of indicating to the public how it should regard and use the several branches of the profession. This year, at Aberdeen, Dr. Thomas Fraser, looking back over much the same type of practice as his predecessor in the presidential office, has drawn attention to the effect on the profession itself and on the character of its work of events of the last forty years. The two presidential addresses are thus, to a large extent, complementary, and are admirable specimens of what is appropriate on such occasions—something which will serve to place broadly before members of the profession the essential nature of the effects of advancing knowledge and changing conditions, and at the same time to instruct the public as to the practical significance of the former and as to the need for preserving among the latter those principles and methods which are of fundamental importance and value. Dr. Fraser must be congratulated upon the admirable performance of a difficult duty, and thanked for a most useful contribution to professional thought.

The two important factors during the period and in the sphere surveyed by the President have been social legislation and war experience. Few among the younger generation of the profession can realize how profound and far-reaching their influence has been in research, in hospital arrangement and usage, in public health work, and in general practice. In at least two of these fields there have been considerable numbers within the profession who have regarded the changes brought about by social legislation not merely with suspicion but with real apprehension or even alarm. Some among the older generation, now necessarily diminishing in numbers, have never been able to reconcile themselves to these changes, in spite of the fact that experience has shown many fears to be unrealized, and has led to adaptations which have removed other fears that had a more solid foundation. On the other hand, among younger members of the profession, whose medical education and experience have been wholly under the newer conditions, there may be a failure to realize or properly to value some of the features of pre-war practice which are of vital importance if the independence, freedom, and broad sphere of work of the profession are to be preserved. To both these classes of practitioner Dr. Fraser has rendered a service in his address. If he has no doubt that the effects of social awakening, State activity, and war experience have reacted most beneficially upon the profession as well as upon the public health, he does not fail to note the prime importance of traditional virtues, methods, and conditions. If team work in all the branches of medical practice previously mentioned has many advantages, the value of individual initiative and personal responsibility cannot be overrated. If communal organization and financial aid have indispensable advantages, it may yet be well to recognize the danger of any tendency to lessen self-reliance and reasonable self-confidence, and the need for proper usage of simple and inexpensive methods as opposed to the undue resort to a multiplicity of advisers or to an over-elaborate technique. The striking improvement in general nutrition and physical health as compared with pre-war years, better education and understanding as to public health and personal hygiene, the changed outlook of the industrial population due to national health insurance, workmen's compensation, unemployment benefit, and other like factors, the increased attraction of hospitals and facilities for admission thereto, the practical applications of a wider field of research and of intensive experience in the war, have all influenced the conditions under which medical practice is carried on, and the President's forcible reminder of these things should stimulate thought as to how advantages can be consolidated and extended, and how some obvious dangers may be avoided.

Dr. Fraser has performed a further service by that part of his address in which he demonstrates that many of these changes in communal and individual health and in the attitude of the public have been brought about by the direct activities of the profession, through the British Medical Association in particular. Curiously, he does not mention the persistent action and decisive influence of the Association in the establishment of the Ministry of Health itself; but he does emphasize, what is too often forgotten or ignored, that it was the

initiative and insistence of the Association which led to the establishment of the School Medical Service. He notes also the paramount influence of the Association's reports on ophthalmia neonatorum, on nutrition, and on physical education, and of its activities in improving the character and status of the Public Health Service, and in so moulding (both in its legislative and its administrative stages) the scheme of national health insurance that some great and imminent dangers were avoided and a better service brought into being. From its foundation, he says, the Association has been chiefly concerned with the maintenance of the professional standard of education and conduct, the promotion of scientific research, the promotion of a national public health policy which will allow the profession to make its maximum contribution to the well-being of the country and the improvement of efficiency in all branches of medical practice at home and abroad. Dr. Fraser has himself been an assiduous and influential worker to all these ends within the ranks of the Association, and all its members, as well as many others, unite in wishing him well throughout his presidential year.

LEUCOCYTOSIS AND LEUCOPENIA

It is generally agreed that the white blood cells may be unevenly distributed through the vascular system, and that large quantities of cells may be moved from one territory to another for the most divergent reasons. This irregular distribution is connected with the tendency of the cells to assume a marginal position in the smaller vessels, or paracapillaries, as Vejlens[1] calls them in a useful monograph on the distribution of leucocytes in the vascular system. It is usually held that the abdominal vascular region must be regarded as the reciprocal of the periphery, increase in the one being associated with decrease in the other. Vejlens deprecates the tendency to think in terms of leucocyte depots, and emphasizes the far more important distinction between the large vessels and the para-capillaries. A depot is merely a situation in which para-capillary vessels occur in large quantities and the circulatory conditions are such as to admit at the time of an extensive marginal position of the white cells. Vejlens shows by direct observation that factors which cause the white cells to accumulate in the para-capillary vessels are dilatation of the vessels, slowing of the circulation, and increase in the sedimentation rate of the red cells. In his experiments accumulations were especially likely to occur in the lungs and the spleen, owing partly to the experimental conditions and partly to the vascular structure of these organs. It follows that in any study of the white cells the observer should be certain of the source of his blood samples before he interprets them. Blood obtained by venepuncture is truly representative of the state of affairs in the veins, but blood obtained by puncture of the skin or an internal organ cannot be assumed to be capillary blood. In the latter case only the first few drops indicate the local blood count, for the marginal white cells are carried out first and after a short time they are exhausted. At least one-third of the polymorphonuclear leucocytes in the skin are marginal. There are no marginal leucocytes during hyperaemia, but their number increases in stasis and pneumonia.

The distinction between true and false leucocytosis is emphasized by Das Gupta[2] in an interesting study of the action of a number of drugs presumed to be leucopoietic. Gupta assumes that leucocytosis may be due to (1) redistribution of circulating leucocytes, (2) mobilization of preformed reserves in the marrow, and (3) increased maturation of granulocytes; and he assumes that the third property alone is likely to be of value in therapeutics. Only transient leucocytosis, due mainly to redistribution and partly to mobilization of leucocytes, was observed after single injections of pentnucleotide, sodium nucleinate, liver extract, histamine, adrenaline, and acetylcholine and related substances. Colchicine stimulated the proliferation of cells in the marrow, but the toxic effects of this drug outweighed its stimulant powers. No evidence was obtained that liver extract or pentnucleotide can accelerate the formation of white cells in health, even though injections are frequently repeated. Das Gupta criticizes the physiological evidence on which the introduction of pentnucleotide into therapeutics was based, and suggests that the associated procedures to which the experimental animals were submitted were in themselves enough to produce leucocytosis and hyperplasia of the marrow. He points out that neither iron nor liver will raise the red cell count beyond the normal level, and sees no reason why the leucopoietic tissues should behave differently when they are supplied with an excess of haematinic principles. In theory, liver and pentnucleotide might raise to normal a leucopoiesis which had been depressed, but in practice they have been disappointing. At present the only way in which leucopoiesis can be raised above the normal level appears to be by some injury to the blood or blood-forming organs, and we remain ignorant of the chemical principle or principles by which these reactions are mediated.

[1] *Acta path. microbiol. scand.*, 1938, Supp. **33**.

[2] *Indian J. med. Res.*, 1939, **26**, 947.

The leucocytosis which occurs with exertion and excitement is probably a redistribution phenomenon. The nervous system plays some part in its control, but Fuzii[3] has shown that, though diminished, it is not completely abolished by sympathectomy. The more remote possibility of an effect of the nervous system on leucopoiesis is raised by Reznikoff's[4] finding that the most constant aetiological factor in agranulocytosis is a period of fatigue, worry, and sleeplessness. It is unlikely that the nervous state is the result of leucopenia or that a certain level of circulating leucocytes is necessary for the sense of well-being, for patients with chronic hypoplastic anaemia make no such complaints. There can, however, be no doubt of the importance of a good white-cell response in resisting infection. Van Duyn[5] emphasizes the value of counting the white cells after operation when the patient takes an unexpected turn for the worse or follows a progressive downhill course. Surgeons are all familiar with leucopenia from overwhelming infection, but Van Duyn has found it where the degree of sepsis might have been thought insufficient, so that it seemed probable that the leucocyte reserve was at a low level before operation. He advises injection of liver and transfusion. Massias and co-workers[6] advise vitamin therapy, and especially vitamin B_1, as its chemical structure is allied to that of pentnucleotide, but neither their arguments nor their case histories are very cogent.

VOLUNTARY EFFORT IN MENTAL HEALTH

The publication of the report of the unofficial committee which has been working for three years under the Earl of Feversham is one of the most important events in mental health work since the passing of the Mental Treatment Act, 1930. With the realization that mental ill-health is a growing menace to the welfare of the community, voluntary organizations have grown up all over the country to deal with one or other aspect of the problem. In some areas a voluntary committee has set up an out-patient clinic for adults; in others a child guidance clinic or children's centre; in yet others a society has been formed for spreading the principles of mental health. In London there are a number of important central bodies. The Mental After Care Association has existed for over fifty years and maintains convalescent homes for mental hospital patients and cares for patients on their discharge. The Central Association for Mental Welfare links up the activities of many local voluntary associations and assists local authorities in ascertaining and looking after mental defectives; it also performs valuable instructional work. The National Council for Mental Hygiene has a variety of aims, of which perhaps the most important are research and education. The Child Guidance Council promotes the formation of child guidance clinics and the knowledge of child psychology. The name of the Institute for the Scientific Treatment of Delinquency explains its work, and the Tavistock Clinic is the largest out-patient centre for minor mental disorder in the country. The activities of these bodies are fairly well co-ordinated one with another, but the work of the numerous societies outside London is hardly co-ordinated at all, except for those which are affiliated to the Central Association for Mental Welfare. Each has grown up to meet a local need, and until the Feversham Committee began its work no one knew precisely what societies existed or what they were doing. In some areas there is wasteful competition; in others no mental health work at all is being done. Some of the large London societies felt a decade ago that the circumstances called for an effort towards closer co-ordination. Various attempts were made but failed, chiefly because they were confined to persons too intimately connected with the movement to be able to see the wood for the trees. The Feversham Committee was a new departure, for it combined the leaders of the mental health movement with a number of capable and distinguished persons who had no connexion with any society for the promotion of mental health and were therefore able to maintain a broad and balanced outlook. This admixture of independent members and an experienced and impartial chairman has enabled the committee to go much further along the road of constructive planning than any previous body has been able to do.

The first aim of the committee, when it met in the spring of 1936, was to discover what services existed. It sent out questionaries to practically every person and body, official and unofficial, that could conceivably be supposed to be doing mental health work of any kind. An enormous mass of material was received, and was put into order by Dr. J. M. Mackintosh, now Chief Medical Officer to the Department of Health for Scotland. His work formed the basis of the committee's report, which we summarize on page 239. The report fulfils two main purposes: it presents a chart, full of complicated detail, illustrating as no other survey has done the position of the mental health

[3] *Tohoku J. exp. Med.*, 1938, **34**, 542.
[4] *Amer. J. med. Sci.*, 1938, **195**, 627.
[5] *Arch. Surg.*, 1938, **37**, 302.
[6] *Rev. méd. franç. d'Extrême-Orient*, 1938, **16**, 94.

services to-day; and it draws up in elaborate detail a plan for the future. Everyone interested in mental health should get the report and study it, for it will probably form the basis of discussion on mental health problems for a considerable time to come. It has brought a large measure of certainty into a very obscure field, and has shown the underlying causes of the present comparative lack of progress.

The proposals for co-ordination offer a substantial hope of bringing order out of chaos, and a complete set of directions on how to do so. The committee has no intention of allowing its findings to be merely discussed and pigeon-holed; it has formulated the machinery for carrying out its recommendations. It recommends that the Central Association for Mental Welfare, the National Council for Mental Hygiene, and the Child Guidance Council shall amalgamate and form a new body to be called the National Council for Mental Health for England and Wales. These three bodies are in favour of amalgamation as a principle, and the committee's report will give them a detailed scheme which they can adapt to suit themselves. The new body would have included the Mental After Care Association, but the officers of that long-established society could not consent to surrender their autonomy. Their refusal is unfortunate, but in no way prejudicial to the success of the new body, as the activity of that Association is confined within narrow limits. The committee proposes as a first step that its recommendations should be discussed by the governing body of each of the three societies. It then suggests that each of the governing bodies should pass a resolution adopting the principle of complete amalgamation, with the proviso that a draft constitution (based on the Memorandum and Articles of Association which the committee has had drafted and includes in its report) be drawn up and submitted to each of the societies, together with detailed financial proposals for the first three years, and that the present staff of the three societies be absorbed. The next step is that each of the societies shall appoint three members to serve on a special committee under an independent chairman to draft the regulations of the new council, to work out administrative details, to formulate a scheme of work for the transition period, and to submit proposals for finance. When that committee is formed, which it is hoped will be in the autumn, the Feversham Committee will hand over to it the task of working out the amalgamation and disband.

As a counterpart to the centralizing voluntary body, with its departments and ramifications throughout the country, the committee recommends that each local authority shall, in so far as the present law will allow, unite its visiting committee and Mental Deficiency Acts committee into a single mental health committee, sharing its staff with the education committee, and in close touch with the public assistance committee, the local voluntary bodies, and the National Council. This reform could be to a large extent carried out without fresh legislation. Its advantages in economy and smoothness of working would be incalculable, and it would facilitate that interaction of voluntary and official effort which at its best is so effective and so suited to the social constitution of this country. The value of a central voluntary organization would depend almost entirely upon its personnel, but if capably administered it might well transform the whole face of the mental health services. A centralized appeal would abolish the present competition for public support, and the needs of each branch of mental health would be considered from a national instead of merely a local and fortuitous point of view. Progress might be made with that most urgent of all needs, the training of psychotherapists for out-patient clinics and delinquency services, and the training of mental health social workers might be centralized and unified. Public education could be carried out on a scale that has never yet been attempted. Social research would be co-ordinated and an enormous amount of material that is now wasted could be made available. The committee has made out a very strong case for its plan, which deserves the support of everyone who has the mental health of the country at heart.

"THE BOOK OF ABERDEEN"

Annual Meetings come and go and leave pleasant recollections, but in one respect each meeting contributes something of permanent value, especially to the locality in which it is held, and this, moreover, is the product not of the guests but of the hosts. Thanks to local enterprise and talent in the various centres visited by the Association there is now a very handsome collection of books, of which *The Book of Aberdeen* is the latest example, which would probably never have been compiled but for the stimulus of the meeting. The Aberdeen volume is noteworthy even in this excellent series for its readability, its attractive appearance, and the wealth of material it brings together. It is as full of information as an Aberdeen hamper of fish after a good trawl. The stale old joke about the stinginess of Aberdonians is once again refuted in these abundant pages in which the story of the university and the town and the countryside is told by those who are best qualified to tell it. The compiler, Dr. David Rorie, has enlisted more than a score of contributors who deal with different aspects

of the granite city past and present. Dr. Douglas Simpson, the librarian of the University of Aberdeen, sketches the academic history, and reminds us that the school of medicine there is the oldest in Great Britain, the constituent charter having been granted in 1505. For many a year, until the foundation of the University of Durham spoiled the jest, Aberdeen boasted that it had as many universities as all England—that is to say, two. Equally interesting for its many quaint touches is the account which Dr. G. A. G. Mitchell gives of the earlier medical history of Aberdeen. We are told that the first practitioner whose name has been preserved was one Donald Bannerman, physician to David IV, who flourished in the fourteenth century. Another chapter by the same writer recounts the history of the medical school, and mentions some of the famous early graduates. The Aberdeen Medico-Chirurgical Society, at first called simply the Medical Society, was founded just 150 years ago. One of the men closely associated with its early history—he can hardly have been a founder, for he was only 18 at the time—was Sir James McGrigor, who became the "father" of the Army Medical Corps, and whose statue is familiar to visitors to the quadrangle at Millbank, while an obelisk to his memory stands in Duthie Park in his native city. The present year marks the two hundredth anniversary of the Royal Infirmary, and Dr. J. C. Knox briefly outlines the story of that famous institution. All the other hospitals and sanatoria, as well as the public health administration, are similarly treated, and then we have a survey of Aberdeen's educational institutions—the Grammar School, one of the oldest in the British Empire, and Robert Gordon's Colleges, a campus unsurpassed in Scotland for beauty and quiet dignity. There are also the various institutes for scientific research, not forgetting the Rowett Institute for research on animal nutrition, which was just beginning its work at the time, twenty-five years ago, when the British Medical Association last visited Aberdeen. The story of the prehistoric monuments of Aberdeenshire, the old spas, including Pannanich Wells and the Wells of Macduff, the castles of the north-east, and the archaeology and folklore and legends of Deeside, is related with Scottish enthusiasm, and is full of interest. But the most enthusiastic pen treats of Aberdeen itself, which the narrator claims to be the third city in Scotland for population, the most northerly city in the British Empire, with an annual record of sunshine higher than any of the British resorts, and as wealthy per head as any city in the kingdom. Its motto is "Bon Accord"; its toast to the stranger within its gates is cordial: "Happy to meet, sorry to part, happy to meet again." Dr. Johnson—one of its freemen—said of it that "the houses are large and lofty, and the streets spacious and clean," and of his inn, "A very good house and civil treatment." So was Aberdeen, and so it is, and so the visiting members of the British Medical Association this week have found it. We congratulate the compiler on a noteworthy achievement. The book is published by the Executive Committee of the Aberdeen Division.

STAPHYLOCOCCAL INFECTION OF THE KIDNEY

Staphylococcal infections of the kidney, apart from the pelvi-calycal infections associated with stones, are relatively rare, usually cortical, and haematogenous, their source being commonly a boil in the skin or a carbuncle. Early diagnosis is difficult, for in a great many cases no pus or bacteria are found in the urine, and the patient is usually not seen until a secondary perinephric abscess has developed. Recognized staphylococcal lesions of the kidney include multiple, bilateral, minute, pyaemic cortical abscesses; a subcapsular triangular septic infarct, probably present when perinephric abscesses resolve after simple drainage; and, thirdly, the deep cortical "carbuncle," drainage of the associated perinephric abscess often resulting in a persistent sinus, which either does not heal without nephrectomy or else heals only to be followed by recurring symptoms. Renal carbuncle is commoner in men than in women, the favourite age being 20 to 35, and there is usually an interval (during which, presumably, the renal lesion forms) of two to eight or more weeks between the initial skin lesion and the onset of symptoms, which at first are merely those of a general infection—rigor, malaise, pyrexia, tachycardia. After a further interval, the duration of which apparently depends on the distance of the lesion from the surface of the kidney (the deeper the focus the slower the development of symptoms), there are local phenomena—pain, tenderness, rigidity, and, finally, swelling in the loin. Renal carbuncle, most commonly due to *Staphylococcus aureus*, is usually unilateral, single, and situated in one of the poles, where it bulges on the surface. Its surroundings of dense fibrous and granulation tissue explain alike the rarity of rupture into the pelvi-calycal system (and thus of pyuria), and the lateness of development of perinephric abscess. Important diagnostic points are the history of a primary staphylococcal lesion, the early absence of urinary symptoms, a high leucocytosis, and (with a deep or large carbuncle) deficient or distorted pyelograms, obtained by intravenous or ascending routes; commonly one or more calyces are widened or obliterated. Even at the late stage, when there are local physical signs in the loin, by which time a perinephric abscess has usually formed, pyelography is useful as a guide to treatment. This, according to Girling Ball,[1] should be as conservative as possible—for example, drainage of a perinephric abscess. If complete restoration of health or of pyelographic deficiencies does not follow, the affected kidney should be removed if its fellow be sound. But the discovery of a large carbuncle before the formation of a perinephric abscess suggests early nephrectomy, which will avert a prolonged illness. Spence and Johnston[2] lay stress on urography as the greatest single objective aid in the diagnosis of renal carbuncle, and point out that both enucleation of the carbuncle and incision and drainage are being performed more commonly than hitherto, their impression being that, unless more than

[1] *Brit. J. Urol.*, December, 1938.
[2] *Ann. Surg.*, 1939, **109**, 99.

one-third of the kidney is involved, some such conservative procedure seems preferable as the first step in treatment. It is noteworthy that the operative mortality has dropped of late. Yet statistics are variable as regards the differential mortality between nephrectomy on the one hand and conservative enucleation or incision and drainage on the other. What is certain is that, apart from operation, the general progress of renal carbuncle is to a fatal issue from subphrenic abscess, septicaemia, exhaustion, or peritonitis, whereas with timely operation the prognosis is fairly good.

A PNEUMOCOCCAL (TYPE I) OUTBREAK

A Type I pneumococcal infection is usually regarded as being of limited spread, sporadic cases being the rule with apparently little if any connexion between the separate foci of infection. That such an assumption may be false is shown by the systematic investigation of a recent outbreak in the U.S.A.[1] The infected area comprised a group of some half-dozen villages a mile or two apart, with a total population of less than 1,000. The chief industry, apart from farming, is the manufacture of cotton gauze in the chief village, which lies in the centre of the group, so that the whole forms an enclosed community with little outside traffic. Towards the end of March last year an unusual number of cases of pneumonia and of suppurative ear disease were reported to the Health Department, and these were put down at first to streptococcal infection; but a peculiar and common sequence—namely, earache, ear discharge, pneumonia—led to further investigation. The communicable nature of the infection was demonstrated in a rather tragic fashion by the local doctor dying from lobar pneumonia, and two nurses developed ear disease from which Type I pneumococci were recovered. Local interest in the investigation brought to light many cases of simple earache that would have passed unnoted, and it was observed that these were more often associated with family contact with cases of pneumonia than with any other disease. As these cases had been appearing since the beginning of February it was not possible to classify them all according to cultural findings, but a typical cross-section gave highly suggestive results. In 34 per cent. of the known cases pneumococci Type I were consistently found in the sputum, throat cultures, and ear discharge. The attack rate was highest in the younger age groups, but healthy carriers were confined to the adult age group. Most of the positive throat cultures were returned negative after about two weeks, but in some exceptional cases the carrier stage lasted for three months or over; some of these, however, may have been reinfections. Investigation of the school children showed that all who were ill or who were carriers came from families where other persons were probably infected. On the other hand, many non-infected children came from infected homes. All the probable cases of pneumococcal infection and all healthy carriers had at least one member of the family who worked in the mill, except the family of a farmer who sold milk but who had frequent contact with mill workers. The possibility of a milk-borne infection was investigated, but with negative results. It is suggested, therefore, that the probable focus of infection was the mill, from which cases and carriers conveyed the organism to the several homes.

[1] *Amer. J. Hyg.*, 1938, **28**, 345.

TOXIC ACTIONS OF THIOCYANATES

Pauli in 1903 stated that thiocyanates were effective in reducing high blood pressure. The drug was used for this purpose but fell into disrepute on account of the toxic side actions that it set up. Westphal in 1925 reintroduced the drug for the treatment of hypertension. This use has been criticized on the grounds that the drug is valueless for this purpose and may be dangerous. Thiocyanates may give rise to a condition resembling iodism, but the commonest toxic effect is muscular weakness coupled with cerebral symptoms; the latter may resemble those seen in bromide poisoning. Thiocyanates rarely cause fatal poisoning, but Garvin[1] reports a death following administration of therapeutic doses. He found seven human fatalities recorded in the literature. In three of these large quantities were taken with suicidal intent, but four were the result of therapeutic administration. The estimations of blood thiocyanate in the case reported by Garvin show clear evidence of cumulation, and suggest a daily excretion of about one-tenth of the thiocyanate present in the body. Severe toxic effects occurred when the blood thiocyanate rose to 18.7 mg. per 100 c.cm. Wald, Lindberg, and Barker[2] have provided a review of the results of thiocyanate therapy, and conclude that thiocyanates are of therapeutic value when the blood concentration rises to between 8 and 14 mg. per 100 c.cm., but that higher concentrations (15 to 20 mg. per 100 c.cm.) are definitely poisonous. This conclusion indicates that thiocyanate therapy is dangerous in that the drug, which is cumulative, must be pushed to very near the toxic level. The authors point out that the method can only be safe if the blood thiocyanate content is measured regularly. They also make some disquieting observations on the subject of chronic poisoning. In some cases, they believe, the use of the drug has induced angina, and it is observed that patients who have taken thiocyanates over periods of five to ten years become anaemic and thin and undergo muscular wasting. It appears that thiocyanate treatment for hypertension is a method that needs extremely careful supervision.

We regret to announce the death of Professor Archibald Young, who had been Regius Professor of Surgery in the University of Glasgow for the past fifteen years.

At the first meeting of the new Council of the British Medical Association, held in Aberdeen on Wednesday, July 26, Mr. H. S. Souttar was elected Chairman of Council in succession to Sir Kaye Le Fleming.

[1] *J. Amer. med. Ass.*, 1939, **112**, 1125.
[2] Ibid., 1120.

WAR WOUNDS AND AIR RAID CASUALTIES

The following is one of a series of lectures on the Treatment of War Wounds and Air Raid Casualties recently delivered at the British Postgraduate Medical School

THE ABDOMINAL INJURIES OF WARFARE—II

BY

GORDON GORDON-TAYLOR, O.B.E., M.A., F.R.C.S.

Wounds of Colon from Gunshot and High Explosive

The experience of a single operator may doubtless be capricious, but unfortunately my solicitude, which was awakened by all except the more simple forms of colonic wounds of gunshot origin, seems justified after perusal of the collected results of many surgeons published at the end of the war of 1914–18. In view of the increasing proportion of casualties due to high explosive there is little reason to think that the character of colonic injuries will be less severe or baleful in future campaigns. In the more frequent or typical examples of wounds of the large intestine, anatomical considerations played no small part in determining the serious character of the injuries.

(*a*) The frequent retroperitoneal situation of one or more of the wounds of this portion of the bowel increased yet did not condone its liability to be overlooked by the surgeon.

(*b*) The vulnerability of the retroperitoneal tissues to infection, more especially to anaerobic invasion, added to the gravity of gunshot wounds of the large bowel; the absence of a mesocolon in certain segments of the large gut, whereby the bowel and the lethal retrocolic and paracolic tissues were more closely juxtaposed, increased the potentialities of these vertical portions of the colon for threatening life in the event of wounding.

(*c*) Concomitant bruising of the large bowel was often considerable, and sometimes extended no small distance from the margin of the actual wound; this phenomenon was encountered much more frequently than in the case of the jejuno-ileum; surgical suture of the colon was thus rendered less secure and certain. The deposit of fat in the wall of the colon is always fraught with some surgical misgiving, and its existence demands watchfulness on the part of the operator; extravasated blood in the intestinal coats of the obese engenders a sense of still greater incertitude. Isolated bruised areas were often seen on the large bowel, and were not infrequently remote from the track of the missile. Such contusions varied in depth and surface extent, and were of some concern in view of their liability to lead to secondary perforation. Prophylaxis against this sequel demanded the most adequate provision for drainage.

(*d*) The outer coats of the large gut were sometimes ruptured and stripped back from the underlying intact mucosa; this phenomenon was occasionally discovered in close proximity to the track of the missile, and at other times might be remote from the actual perforation of the bowel. These injuries add to the anxieties of conservative surgery.

(*e*) The more fixed portions of the colon contrast with the small intestine in the matter of surgical accessibility, and the exposure of a retroperitoneal wound of the flexures or of the vertical segments of the colon through a mid-line incision might be associated with serious technical difficulties.

(*f*) The early escape of fluid faecal material from the lumen of the large bowel in cases of gunshot injury was more frequent than from the small gut, and its occurrence augmented the gravity of the prognosis: a peritoneum inundated with a flood of highly infective fluid from the intestine, the extraperitoneal tissues or psoas muscle soaked and sodden with escaping bowel contents, rendered efforts to save the patient fruitless and wasteful of time.

(*g*) Infarction was more often met with in the large bowel than in the small intestine in cases of gunshot wounds; such cases demanded drastic rather than conservative measures.

Method of Surgical Approach

I have always had a predilection for incisions made directly over the portion of the colon which demands surgical intervention; thus I have made frequent use of flank, iliac, or even subcostal incisions, in which the muscles of the parietes are divided in order to ensure adequate exposure of the field of operation. Such avenues of approach reduce to a minimum the anxieties of handling wayward small intestine, and the dangers of generalized contamination of the peritoneal cavity are thereby reduced.

In the case of "through-and-through" wounds of gunshot origin far out in the flank or iliac region, where any injury to the abdominal contents seems problematic, or where the outer border or posterior surface of the colon is the most likely site of visceral injury, a lateral incision may perhaps be profitably utilized; yet there can be no certainty about the anatomical disposition of the abdominal viscera, and it must be remembered that on the left side of the peritoneal cavity the descending and iliac portions of the colon are often overlapped by coils of the small gut. In most cases the surgeon will therefore be wise who primarily utilizes the mundane median or paramedian incision, so that he can assure himself beyond a doubt of the presence or absence or amount of damage within the belly. Should the position of a colon wound revealed by laparotomy render the injury inaccessible to surgical suture or to other treatment through a midline incision, or should provision for adequate drainage appear desirable or imperative, approach can then be made by a supplementary incision in the flank or at the periphery of the abdominal wall. If there chance to be wounds of entry or of exit in flank or iliac fossa or over some remote corner of the abdominal cavity, such may be carefully excised, enlarged, and converted into a more convenient avenue of surgical approach to the injured abdominal area.

In deciding in favour of the preliminary median or paramedian incision it must be remembered that in not more than 60 per cent. of the cases of injury to the large intestine is the colon the only segment of the alimentary canal involved. In 40 per cent. large-intestine injury is complicated by lesions of other hollow viscera. No risks must be taken therefore: the operator must make absolutely sure.

If preliminary laparotomy reveals no intraperitoneal injury, great care must be taken not to convert a small or uncomplicated extraperitoneal wound of the caecum or the vertical colon into one which implicates the general peritoneal cavity. Such smaller wounds may be trimmed and sutured from a posterior approach, provision being made through the muscle-cutting flank incision for drainage of the contaminated area.

Treatment

The treatment of gunshot wounds of the large intestine will, of course, vary with the anatomical and pathological character of each individual injury; the surgical measures adopted may also be dictated by other considerations, such as the coexistence of multiple injuries, concomitant haemorrhage, etc.

Small intraperitoneal wounds of the caecum and colon merely require suture, but in the case of this part of the bowel there is not the self-same confidence in the efficiency of a single suture that obtains in small-intestine injury, and most surgeons will employ a double layer of sutures. Greater confidence will be felt if a graft of omentum or an appendix epiploica can be utilized to reinforce the suture line. Most of the successful cases of gunshot injury of the large bowel are of this type.

The more frequent and typical gunshot injury of the colon has many or most of the characteristics that I have already described: most of the wounds are associated with greater contusion than obtains in the small bowel; infarction is more frequent, and the adjacent extraperitoneal tissues of the postero-lateral wall of the abdomen are the seat of a haematoma, certainly contaminated, perhaps already gravely infected with organisms which may have been introduced with the missile or may have been denizens of the lumen of the injured intestine. In some cases the wounds are large and gaping; they are rarely multiple, but the damage and tearing of the coats of the caecum or colon render local suture unpromising.

INDICATIONS FOR RESECTION

I therefore find myself in disagreement with those who deny a place for resection in the case of colon wounds. I am convinced that resection is the method of election —or, indeed, of necessity—in the following cases: (*a*) those whose caecum or colon is in a condition of infarction; (*b*) where there is extensive separation of the bowel from the mesocolon, especially if the latter is the site of a haematoma or is actively bleeding; (*c*) in cases where the vitality of the bowel is crushed out of existence by a large piece of metal or a fragment hurled with all the force of a high explosive; and (*d*) in some cases where the wound of the large intestine has been of such magnitude or difficulty of approach as to suggest the formation of an artificial anus. In the last-mentioned group recourse may well be had to resection, when the high mortality of the colon anus in the great war is borne in mind; the adoption of this procedure would of course be influenced by the general condition of the patient.

The wide removal of damaged bowel and of the adjacent devitalized retroperitoneal tissue which resection facilitates finds justification not only in being in accord with the ordinary treatment of gunshot wounds by excision of the damaged area, but also by the good results in certain personal cases in which this more drastic operation was undertaken. A temporary or prophylactic caecostomy proved of inestimable value in my hands in these large-intestine resections.

It is by no means remarkable that resection should have been discouraged in the case of gunshot wounds of the large bowel, for the approximation of healthy segments of colon after the removal of damaged gut is, in most parts of the large intestine, a far less simple surgical exercise than in the case of the closely approximated coils of jejuno-ileum, with their common mesentery: the sacrifice of considerable segments of sessile colon may be necessary in order to secure a satisfactory end-to-end union of healthy, undamaged segments of large bowel without tension. Moreover, large-bowel resection is not without its dangers, even in the tranquil atmosphere of the surgery of every-day life.

In the less serious type of wound of caecum or colon suture is, of course, to be preferred to resection. Suture suffices admirably in this group of injury: such wounds are mostly of the nature of tears or perforations, and the bowel is rarely divided completely. Moreover, the absence of numerous loops and coils makes multiplicity of wounds uncommon, thus contrasting with their frequency when the small intestine is damaged.

Despite the risk of wearisome repetition, one cannot emphasize too strongly the extreme probability that a wound of the colon or rectum is of a perforated character, and it behoves the surgeon to satisfy himself as to the existence or absence of a retroperitoneal wound in addition to more obvious and accessible peritoneal injury of the large bowel. These retroperitoneal colonic injuries, with consequent infection of the extraperitoneal tissues, are much more likely to be fatal than intraperitoneal wounds. The term "colon septicaemia" was applied by Sir John Fraser to a group of symptoms indicative of an intensely rapid septicaemia which was met with in the case of wounds of the colon with a spreading infection to the retroperitoneal space; such were encountered especially in lesions of the more fixed portion of the large intestine where no mesentery was present. These wounds ran a sinister course partly because the tissues behind the coelomic cavity had not the powers possessed by the omentum and the peritoneum of dealing with organisms, especially anaerobes; partly because the retroperitoneal space, when infiltrated with blood, provided an ideal pabulum for the growth of infection, since injuries of this part of the bowel were difficult of exposure and access and held suture badly; and partly because there was difficulty in some cases in establishing drainage, especially in injuries of the rectum.

As a means of preventing fatal infection of the retroperitoneal space *colostomy sometimes proved valuable*, but this operation must be performed at a very early period before infection actually obtains hold of the vulnerable tissues behind the peritoneum, and reliance must never be placed upon its performance alone as an alternative measure to the establishment of free and adequate local drainage.

Attention may be appropriately directed here to the gangrenous ulceration of the mucous membrane of the more fixed parts of the large bowel to which Hamilton Drummond and Shaw Dunn first drew attention. This very rapid gangrene of the mucous membrane seems to be caused by the deprivation of its blood supply through the rupture of the small vessels and laceration of the underlying muscular coat of the bowel produced by a missile, the actual track of which may be some distance from the intestine. In these bursting or traction injuries the gangrene of the bowel leads almost at once to a severe infection of the retroperitoneal space. Colostomy can be of no more service in this class of case than the performance of an enterostomy in the treatment of a gangrenous appendicitis.

It is in such wounds that heroic measures must be employed to freely explore, drain, and possibly excise the damaged area of the bowel. Portions of the innominate bone or the coccyx may require removal to effect a thorough exposure of the rectum and the post-rectal tissues.

Wounds of Stomach and Urinary Bladder

Gunshot wounds of the stomach vary greatly in size and appearance, and usually involve both surfaces of the viscus. Suture will be employed as a rule, but the incidence of secondary haemorrhage during convalescence, often of fatal nature, raises the question of the desirability of excision of the damaged portion of stomach wall, when this is in an accessible position and the general condition of the patient does not negative such a step. In certain cases distortion, or uncertainty as to reliable closure of wounds of the pylorus, may suggest a supplementary gastro-enterostomy.

Gunshot wounds of the urinary bladder may be intraperitoneal or extraperitoneal; both surfaces of the bladder may be implicated. This last-mentioned form of lesion is common in buttock wounds, and may be complicated by a fractured pelvis and injury to the intestine. Suture of intraperitoneal wounds is easy; extraperitoneal wounds should be sutured where possible; and a corrugated rubber drain may be inserted if uncertainty be felt as to the security of the suture. In some cases a self-retaining suprapubic catheter may be used with advantage.

Penetrating Wounds of the Solid Viscera

The Liver.—The dimensions of the missile play no inconsiderable part in determining the type of hepatic lesion, which may take the form of a perforation, possibly with cracks and fissures radiating therefrom, a superficial "score," a ragged wound, or a crateriform cavity. The liver is damaged in practically every abdomino-thoracic wound on the right side of the body, and may be badly shattered in such injuries as the "stove-in" chest. The whole organ may be disrupted even by a bullet wound, and as much as one-third of the right lobe has been found loose in the peritoneal cavity. Examination of museum specimens illustrating gunshot injuries of the liver reveals lesions for which surgery is futile. It would be impossible to prevent infection by surgical measures throughout a long ragged track running from one lateral surface to the extreme pole on the other side of the body (Fig. 2),

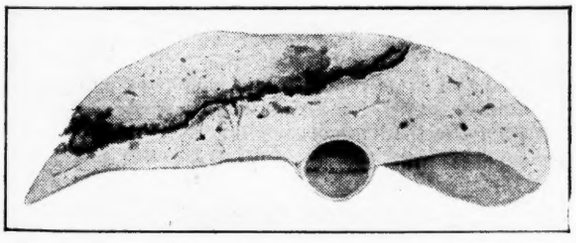


FIG. 2.—Penetrating wound, traversing liver from right lateral surface to left border; the impossibility of mechanical excision and disinfection of such a track is obvious. (War Collection, R.C.S., 966.)

and surgical zeal would be entirely misplaced and probably harmful. The escape of important structures in the portal fissure and in the liver substance is sometimes remarkable, and the fatal ending is often due to damage to other structures.

I cannot agree with certain German writers who state that "the opening of the abdominal cavity is indicated not only in every certain case of liver injury, but also when such an injury is merely probable." If injury to other viscera can be excluded, abstention is the best policy except under the following conditions: (*a*) gross haemorrhage; (*b*) retention of a large missile in an accessible position; (*c*) the probable association of some other abdominal or thoracic lesion which demands exploration. In many cases of liver injury there were few arresting clinical signs, and it is significant that in the abdominal cases which recovered without operation the wounds mostly lay in the liver area. Increasing confidence in the sulphonamide preparations, especially M[c] & B 693, should diminish the incidence of sepsis in these tracks across the liver; and if only pathologists could control the anaerobic infections there would be no thought of surgical intervention for hepatic injury, except under the conditions just mentioned. The danger of bleeding from the liver depends mainly on whether large veins have been broached; if no big vein has been damaged haemorrhage ceases spontaneously. There is usually little oozing of bile, unless main ducts are severed. Collections of bile in the peritoneum and pelvis may occur later, demanding drainage.

Early jaundice may be slight and evanescent, and has no serious portent; the stools remain of normal colour. Later icterus has a much graver significance, and indicates serious infection; it is probably haemolytic in origin. Secondary hepatic haemorrhage is almost invariably fatal, and is usually associated with signs of sepsis, such as pain, elevation of temperature and pulse rate, abdominal distension, pallor, restlessness, and loss of strength. Sometimes a hepatic abscess may develop round a retained fragment of shell or bomb, and may prove fatal if not dealt with by adequate surgical methods.

The Spleen may be injured alone or in conjunction with other abdominal viscera; it is especially liable to damage in left-sided abdomino-thoracic lesions. Every kind of lesion may be produced, and life may be jeopardized by reason of severe intra-abdominal haemorrhage. It has been affirmed that the association of gastric and splenic injury is a fatal one, but this has not been my experience. It has already been advised that splenectomy should not be resorted to light-heartedly, but in my opinion this operation has not greatly increased the risk. The spleen may be exposed and dealt with through a paramedian incision, a Perthes incision, or by an abdomino-thoracic approach in injuries invading both cavities of the body.

The Pancreas.—Penetrating wounds of the pancreas were less frequent in the war of 1914–18, or at any rate less often recognized, than injuries of any other of the abdominal viscera. The intimate anatomical relations of the gland to the large blood vessels are such that a wound of the pancreas involves the greatest risk of an immediate severe and probably fatal haemorrhage. Many wounds of the pancreas doubtless never reached an abdominal hospital, and in such patients as survived to reach an operating theatre the lesion may have been overlooked by surgeons more intent on dealing with injuries of the hollow viscera, or the cases were designated "retroperitoneal haematomata." Successfully treated cases of gunshot injury to the pancreas were certainly recorded by Richard Charles (two), Lockwood, Saint, Mayo-Robson (two), John Morley, myself (three), and others.

Abdomino-thoracic Injuries

Increasing familiarity with the problems of the surgery of warfare, and especially the radical treatment of the more severe injuries of the thorax, for which British surgery is under a special debt to George Gask, gradually led to a diminution in the mortality from these wounds as the years of the great war went by. In 1916 only 18 per cent. of these cases were saved, but in November, 1917, Sir Anthony Bowlby was able to report a recovery

rate of 49 per cent. In the autumn of 1918 I collected the results of 207 operations for abdomino-thoracic injury performed by six surgeons in the Fourth British Army (Jack Anderson, Saint, Stanley, Walker, Hancock, Gordon-Taylor), when the recovery rate reached 66.6 per cent., and in the case of Saint of Capetown and the late Jack Anderson was no less than 80 per cent. The individual results depend very largely upon the involvement of hollow or solid abdominal organs in the complicated injury; the latter type of wound produces a much lower mortality rate, but even in the case of hollow viscus involvement I had a 50 per cent. rate of recovery.

The treatment of abdomino-thoracic injuries may be outlined as follows:

(*a*) Where there is a through-and-through abdomino-thoracic wound on the right side, inflicted by only a small fragment, no active surgical treatment may be required.

(*b*) Where there is an abdomino-thoracic wound on the right side, and a small fragment is retained in an inaccessible position in the liver, an expectant line of treatment is the correct procedure.

(*c*) Where there is a small wound in the thorax, and there is evidence of abdominal injury demanding operation, the belly has priority in the matter of surgery, and should be approached by median, paramedian, or some appropriately placed incision. The thorax may require no special attention.

(*d*) Where there is a through-and-through wound involving thorax, diaphragm, and abdomen, and associated with severe injury to the thorax, the thoracic wound should be dealt with first, and an approach to the upper abdomen made through the diaphragm.

(*e*) Where there is a wound of entry in the thorax, inflicted by a large- or moderate-sized fragment of missile, which is retained, a radiograph is most valuable. The thoracic injury should again be dealt with first, and the abdomen approached through the diaphragm.

(*f*) In some cases, where the wound of the thorax is low down, access to supra- and infra-diaphragmatic areas may be obtained by cutting through the costal arch after the manner of Bland-Sutton, Duval, Kirschner, etc.

Injuries without Penetrating Wound

Injuries of the abdominal viscera may occur without penetrating wound. The demolition of buildings by air bombardment, with bricks, mortar, iron, and timber confusedly hurled by explosive force against the abdominal wall, may rupture intestine or rend the liver without any breach of the skin. Severe damage to the contents of the coelom may even be produced by mere explosive force without any impact of debris on the abdominal parietes.

In the surgery of everyday life it is affirmed that severe contusions of the abdominal wall are not often associated with internal injuries: the blow that expends itself in disrupting the muscular layers of the parietes is said to be too far spent to exert its baleful action on the digestive tube or the solid abdominal organs. No reliance is to be placed on such probabilities or possibilities in the damage inflicted by high explosives. I have no intention of enumerating all the signs and symptoms which point to damaged intestine in contusions of the abdomen; the late W. H. Battle, Sir James Berry, and Zachary Cope have all made signal contributions to our knowledge of this subject. Perhaps the most cogent reason for laparotomy in these cases of suspected gut injury is doubt; and where any uncertainty exists the surgeon should open the abdomen at the earliest moment. When unmistakable signs of peritonitis manifest themselves the golden opportunity has been lost: the patient is already doomed, and operation is only an agonal necropsy.

The surgical diagnosis and treatment of haemorrhage from the solid abdominal viscera are well known to all operators. An adequate exposure of the convexity of the liver in order to deal with liver bleeding may be impossible through the usual median incision. The removal of the cartilage of the costal outlet may be drastic, but emergency may demand the heroic; the adoption of this procedure has certainly been successful on rare occasions in my hands. Temporary control of the bleeding by compression of the structures in the free edge of the gastro-hepatic omentum has been stressed by Hogarth Pringle and Grey Turner.

Laparotomy Incisions and Drainage

Drainage of the Abdominal Cavity.—Where any doubt exists as to the propriety of drainage it is better not to drain. Drainage tracks are prone to become secondarily infected with streptococci on the lines of communication, sometimes with disastrous results.

Closure of the Abdominal Wound.—"Through-and-through" sutures save time, but should be used only on exceptional occasions: a carefully closed peritoneum affords some protection against the spread of infection from the abdominal wall to the coelomic cavity. In cases where large masses of the rectus abdominis or the lateral muscles of the abdomen require incision because of infection or threatened infection with gas gangrene, the space resulting may be temporarily filled with gauze soaked in some antiseptic such as eusol, flavine, etc., which is left in place under the sutured skin and removed only when it is felt certain that the parietal peritoneum is securely healed. A temporary buffer is thus provided between the intestines and the outside world!

DOCTORS IN TIME OF WAR

SCALES OF PAY FOR A NATIONAL EMERGENCY MEDICAL SERVICE

The terms of service under which doctors will be employed on emergency work in time of war are defined in a scheme which has been agreed between the Minister of Health, the Secretary of State for Scotland, and the Central Emergency Committee of the British Medical Association, as representing the medical profession.

The scheme provides for a national hospital medical service for the treatment of casualties, the service being organized and administered directly by the Ministry of Health and the Department of Health for Scotland. Doctors joining the service will assume for a period of three years a definite liability to serve in an emergency.

Method of Recruitment

The service will be recruited from medical practitioners other than those already in the regular whole-time employment of the Government or the local authorities. The British Medical Association is assisting in its recruitment, and doctors wishing to join should notify the Association, through their local Branch or Division, and not the Ministry or Department of Health. There will be two classes of service:

Class A.—Practitioners in this class will, in an emergency, be called up for whole-time hospital service with a liability to temporary transfer to any part of the country. Those required at the outset will be called up immediately an emergency arises; others will be called up at later

stages as required, and in the meantime may be employed as if they were in Class B.

Class B.—Practitioners in this class will be liable for hospital service on a sessional basis in their own hospital area according to the needs of the moment.

Scales of Remuneration

Practitioners in Class A will be paid whole-time salaries and will refrain from engaging in private practice. The scale of salaries in Class A will be as follows:

	Salary
(*a*) Consultant Adviser	£1,400
(*b*) Group Officer	£1,300
(*c*) Medical Superintendent: Hospital of 1,000 beds and over	£1,200
Hospital of 750 beds and over	£1,000
Hospital of 300 beds and over*	£900
(*d*) Officer in charge of surgical or medical division (hospitals of 500 beds and over)	£950
(*e*) Surgeon or physician specialists	£800
Other specialists in charge of departments	£800
(*f*) Medical officers	£550
(*g*) House officers	£350

NOTE: The salaries stated are on a resident basis. If board and lodging are not supplied an allowance of £100 a year will be paid in lieu thereof.

* Special consideration will be given in the case of certain hospitals below 300 beds.

Class B officers will be remunerated on the following scale for work done in hospitals:

For consultant and specialist work—

£2 12s. 6d. per session of two hours' duration up to five sessions in any one week, with £2 2s. for other sessions, subject to a maximum payment of 120 guineas a quarter.

For general practitioner work—

£1 11s. 6d. per session of two hours' duration up to five sessions in any one week, with £1 5s. for other sessions, subject to a maximum payment of 75 guineas a quarter.

Maintenance of Private Practice

This scheme for a hospital medical service is the latest development in the Government's plans for using the medical profession to the best advantage in war. Doctors recruited for the service will be allocated to their war-time positions now. Thus there will be created in peace time an expanded system of casualty hospital staffs which will function automatically at a moment's notice in the event of war. It will, of course, involve the allocation to these potential hospital staffs of some doctors now engaged in private practice. As, however, the allocation of doctors to these and other war-time duties is being carried out through the local emergency committees of the British Medical Association, the maintenance in every area of an adequate number of private practitioners who would continue their ordinary work as family doctors in war time will be secured.

Where a doctor commits himself to abandoning his practice in time of war in order to take up full-time work in the casualty service, arrangements have been made whereby his practice will be temporarily carried on for him by other doctors.

Doctors employed under the scheme will not wear uniform, but they will have a distinguishing badge or other emblem which will indicate whole-time membership of the service.

The whole of the Government's plans for the war-time organization of the medical profession are being worked out in close consultation with the profession itself, and any doctor who is still uncertain as to the way in which he can best serve the nation in war time should seek the advice of the local emergency committee set up by the British Medical Association for the area in which he practises or resides.

VOLUNTARY MENTAL HEALTH SERVICES

THE FEVERSHAM COMMITTEE'S REPORT

The voluntary mental health services have grown up naturally throughout the country in response to local needs. The first of them was the Mental After Care Association, which befriends persons discharged from mental hospitals and helps them back to active life. The Central Association for Mental Welfare was formed soon after the passing of the Mental Deficiency Act, 1913, and now has affiliated to it a large number of local voluntary mental welfare associations; it works in close co-operation with local authorities, chiefly on behalf of mental defectives but in many other branches of mental health as well. The National Council for Mental Hygiene studies social habits and industrial life in the hope of removing the factors which lead to mental stress and unhappiness; it also does valuable educational and co-ordinative work. The Child Guidance Council was formed in 1927 to encourage the provision of skilled treatment for children showing behaviour disturbances or early symptoms of nervous disorder. The Home and School Council is a federation of parent–teacher associations, and is associated with mental health work through its deep interest in child psychology. In addition, there is a growing number of clinics and societies dealing with various aspects of child psychology and other branches of mental health work. Many organizations deal primarily with moral welfare, and maintain hostels, homes, and other services for mental defectives and delinquents. On the borderland of mental health work are such organizations as the National Association of Probation Officers and the Royal Society for the Prevention of Cruelty to Children. The larger organizations have secured a considerable measure of co-ordination, but there is a great deal of overlapping, and the disadvantages of having innumerable voluntary societies working more or less independently towards similar aims have become increasingly ovious. Until the Feversham Committee began its investigations, no one could tell how much overlapping was taking place or how much work was being left undone. No one even knew how many mental health associations existed.

Some years ago the leaders of the voluntary mental health movement felt that the need for united action was urgent, and attempts were made to amalgamate some of the larger associations. These endeavours did not meet with success, largely because of the great diversity in the constitutions, aims, and activities of these bodies. Towards the end of 1934 the National Council for Mental Hygiene and the Child Guidance Council formed a joint subcommittee to suggest means of closer co-ordination. Members felt, however, that before a limited merger was undertaken an attempt should be made to secure a wider co-ordination of the services. The National Council for Mental Hygiene therefore proposed that a layman not actively connected with any mental health society should form a "temporary reconstruction committee," to be composed of two members each from the five largest associations. The Earl of Feversham was invited to undertake this work. He agreed on condition that the committee should be an independent body; that its report should be comprehensive and based on evidence from all the official and voluntary bodies concerned; and that it should contain a number of lay members who had no connexion with any mental health organization.

Scope of Inquiry

The first meeting took place on April 8, 1936, and the committee was expanded by co-option until it consisted of over thirty persons who had either spent a large part of their life in mental health work or who were eminent in other forms of public service. Its membership represented not only the voluntary societies but also, unofficially, the interested section of the medical profession; one of its members was familiar with the work of the Board of

Control, another with that of the Board of Education, and two or three with that of the local authorities. The committee had a double duty: to study as fully as possible the existing conditions and show how far they fell short of the ideal of co-operation and efficient working, and to make positive recommendations for co-operation on a national scale. A working committee was appointed, and collected evidence by means of detailed questionaries from most of the counties and county boroughs and a large number of institutions, societies, and persons connected with every kind of mental health work. To judge from the formidable list of witnesses at the end of the committee's report, very little ground can have been left unexplored.

The report, which has just been published,* is based on the vast mass of evidence which the committee received from these sources. With its appendices it covers nearly 300 pages. Part I is introductory. Part II deals with the mental health services to-day, and shows the chief sources of law governing mental disorder, mental deficiency, education, and delinquency, and the manner in which the law is applied to the statutory and voluntary services. Part III is concerned with the actual position of the services which deal with mental disorder in out-patients and in-patients; the community and residential care of mental defectives; the prevention and treatment of delinquency; the mental health of children; religious and social welfare; and public education in mental health. Part IV is a general review dealing with the law, the distribution of services, and the training of personnel. Part V summarizes the evidence and lays down a number of definite recommendations. Part VI sets out a detailed scheme for amalgamating the Central Association for Mental Welfare, the National Council for Mental Hygiene, and the Child Guidance Council, and an appendix contains a complete memorandum and articles of association for the proposed new body, the name of which, the committee suggests, should be *The National Council for Mental Health for England and Wales.*

The Committee's Recommendations

The committee recommends that unless the local authority decides to provide a combined hospital and out-patient clinic for mental patients, it should make a grant towards the acquisition of suitable clinic premises in connexion with the out-patient department of the general or special hospital, and towards the maintenance of a voluntary clinic. Alternatively, it may pay a grant to a voluntary association for the services of voluntary psychiatric workers; or pay something towards the salary of part-time psychotherapists both at the mental hospital and at the clinic; or give the services of a medical officer of the local mental hospital. In every area the statutory body and the governing body of the voluntary hospital should work in close co-operation; they should form a joint committee or the authority should be represented on the hospital board.

The clinic should have carefully organized liaison arrangements with both the general and the mental hospital and have a call upon beds in both types of institution. The medical staff of every clinic should contain part-time psychotherapists, male and female, who would be able to act as consultants to local general practitioners and would be in close touch with the people of the district. The psychotherapist should, where possible, hold a part-time position at the mental hospital combined with an independent appointment at the general hospital, and be allowed to engage in private practice.

In-patient beds should, the committee maintains, be provided for out-patient clinics. Special hospitals should be established in close association with medical schools, and where no teaching centre is available special blocks for early cases should be set up in close connexion with the general hospital. Otherwise, accommodation for early mental cases should either be concentrated at one of the smaller general hospitals or be provided at the mental hospital. Policy and legislation should be framed on the principle of encouraging the approximation of the mental hospital to the general hospital.

In the field of mental deficiency the committee finds that the present state of the law is a grave hindrance, particularly the provisions which prevent a mentally defective child from being notified unless he has attended a special school or class. It recommends, therefore, that the Mental Deficiency Acts should be redrafted to contain a criterion of social, and not educational, inefficiency. The Education Acts should deal with educational retardation and notification to the mental deficiency authority. Educable mental defectives should all receive some form of special education; ineducable children should be trained in occupational centres or institutions. Socially defective children in public elementary schools should be notified to the mental deficiency authority. Defectives should be admissible as voluntary patients without certification, and voluntary effort for borderline cases must be co-ordinated.

The report contains a considerable amount of valuable information about the training and work of the mental health social worker. The committee deprecates the present division by which one worker does only mental hospital and clinic work, another only mental deficiency work, and a third only child guidance. It recommends a co-ordinated mental health service, with a more comprehensive course of training to be arranged through the central co-ordinating body which it proposes should be set up.

With the object of preventing juvenile delinquency, the committee advocates public education through a well-organized mental health service, to give parents greater understanding of the causes of delinquent behaviour. It recommends a number of measures for which provision is made in the new Criminal Justice Bill, such as the establishment of special observation centres, probation hostels, and residential homes, at which the services of a psychiatrist should be available. In child guidance, it says, the local authority and the voluntary agencies should co-operate to the fullest extent. Voluntary effort should be directed chiefly towards preliminary organization and towards assistance in the work of the clinic to preserve a home-like atmosphere. A parent–teacher association should be formed in schools of all types. Local education authorities should appoint a psychologist to advise them on their educational programme and the treatment of backward children, and a child psychiatrist to deal with special cases of mental defect or behaviour disorder. Wherever possible, the local authority should set up a child guidance clinic, which might well be incorporated in a centre for all activities relating to the mental health of children. Residential homes for maladjusted children should be established either by the local authority or by voluntary agencies, or by both. The child guidance clinic should, where possible, undertake vocational guidance under the educational psychologist.

Education in mental health, the committee also recommends, should be undertaken systematically by local authorities and voluntary bodies. Health visitors of the local authority should be trained to advise parents on the mental health of the child in the home. General biology and the elements of mental health should be part of the school curriculum and later taught in more detail in community lectures. Here also the Committee regards central supervision and approval as indispensable.

Unification of Local Services

As an important step towards that co-ordination of mental health services which is so badly needed in the interests of efficiency and economy, the committee recommends that every local authority should form a mental

* *The Voluntary Mental Health Services.* Report of the Feversham Committee. 1939. London: The Feversham Committee, 47, Whitehall, S.W.1. (2s. 6d.)

health committee—a joint committee of the mental hospital visitors and the committee for the care of the mentally defective. It should include representatives of the education authority and of local persons and bodies interested in mental health. This reform could be lawfully carried out at once, but legislative action would be required to secure the best and smoothest working of such a committee, because at present the two separate committees have different powers. This body and the education committee should have a common mental health staff, and there should be a constant interchange between the public institution and the mental hospital, the clinical supervision being in the hands of a single medical officer. Until legislation is passed local authorities should appoint joint subcommittees to deal with common problems. Every area should contain a voluntary organization to link together all the mental health agencies, both statutory and voluntary, in a single enterprise. The voluntary association in each area should so far as possible extend its work to cover all the ground which the statutory services do not cover. Local authorities already have power under the Mental Treatment Act, 1930, to make grants to voluntary associations; they should use this power to enable the work of the existing organizations to be extended and so avoid overlapping.

A Single Central Association

Perhaps the most interesting result of the committee's long and thorough research has been its plan for a single voluntary mental health society, formed by amalgamation of the Central Association for Mental Welfare, the National Council for Mental Hygiene, and the Child Guidance Council. The committee recommends that the new National Council for Mental Health shall be a guarantee company and that its aims shall be:

(1) To educate the public in an understanding of mental health, and to promote and organize co-operation and development of all activities in this sphere.

(2) To work for and promote the preservation of mental health and the prevention and treatment of mental disorders and defects among both adults and children.

(3) To work for and promote the study of and research into mental health, mental disorders, and defects, and to obtain, make records of, and disseminate information.

(4) To promote the training of workers in the mental health field and the establishment of standard qualifications.

The work of the council would be delegated, as in a local authority, to various committees and departments, each representing a special branch of activity—for example, institutions, homes, and hostels; community care; regional organization; education of the public; training of personnel; research; and social problems. A director—an administrator and preferably a medical man—would be indispensable, and so also would be a part-time psychiatrist. Many members of the amalgamating societies have wide knowledge and considerable influence, and their active interest must be secured for the new council. The committee therefore suggests the formation of groups or special committees of the council who would report to and be represented on its executive committee. Technical advisory committees in psychiatry, psychology, and social work would be set up. One of the first acts of the council should be to establish a regional society for mental health for London and the Home Counties, with an independent chairman. The council would be formed out of the existing material, and should proceed, without any breach in continuity, to group the existing services into such departments as would provide the greatest convenience of administration. This new grouping could not be bound within the limits of the duties which the voluntary associations undertake to-day. Given good will, patience, and an earnest desire for co-operation, the committee believes that the amalgamation can be carried out smoothly and successfully. The Central Association for Mental Welfare, the Child Guidance Council, and the National Council for Mental Hygiene have all expressed their agreement with the principle of amalgamation. The Mental After Care Association does not see its way to enter the scheme.

The Feversham Committee will maintain continuity until the autumn, when the three societies concerned will have had an opportunity of meeting and of coming to a decision on the report. The first step is the formation of a special committee consisting of three members of each society under an independent chairman, to bring the new council into being.

STUDENTSHIPS AND FELLOWSHIPS IN CLINICAL SCIENCE AND EXPERIMENTAL PATHOLOGY

The Medical Research Council invites applications for a fourth series of Studentships and Fellowships intended to encourage young British medical graduates of special ability and original mind towards becoming investigators in those branches of medical science which are concerned directly with disease as it occurs in human beings. This field of research includes investigations into disease or manifestations of disease in patients, together with experimental work of an immediately relevant kind.

Postgraduate Studentships

Postgraduate studentships are offered for medical graduates who have already held house appointments and are strongly inclined to a career in clinical science or experimental pathology. Each selected student will receive a stipend at the rate of £200 per annum, during a period not exceeding twelve months, for personal maintenance while undertaking approved courses of study in this country such as may be regarded as best calculated to advance the student's training in methods of research. This study may include modern languages and such advanced physiological, pathological, and special clinical work under recognized teachers as may be regarded as forming a suitable preliminary to serious research work to be undertaken later; but the approved course may not include studies of which the purpose is to enable the student to pass further examinations.

Research Fellowships

The Council also offers Research Fellowships for candidates of similar qualifications who have already had some experience in the use of research methods. Each Fellowship will be tenable for one year at the ordinary value of £250 per annum, and will be renewable in approved instances at the rate of £300 per annum for a second year. These Fellowships are intended as probationary appointments for research in clinical science or experimental pathology under suitable direction in this country. Research expenses may be provided in addition to stipend.

Applications should be lodged with the Secretary, Medical Research Council, 38, Old Queen Street, London, S.W.1, before October 1, 1939. Forms for the purpose will be supplied on request.

The fourth Congress of French Medical Electro-radiologists, which was to have been held in 1938, was postponed owing to the impossibility of organizing an exhibition of the apparatus. It has now been arranged that it shall take place in the Paris Faculty of Medicine from October 11 to 14, under the presidency of Dr. Louis Delherm. Among the subjects to be dealt with are artificial neutrons and radio-elements, their biological applications and theoretical therapeutics; bio-electrical phenomena of the nervous system; radiotherapy in the treatment of inflammation; and the value of radiological examination in the case of injuries. A detailed programme will be issued later. Inquiries should be addressed to the general secretary of the congress, Dr. Dariaux, 9 bis, Boulevard Rochechouart, Paris, IX.

Nova et Vetera

TWO MEDICAL RARITIES

Two medical tracts bound together, and both excessively rare, are to be sold by auction on July 31 at Messrs. Sotheby's in Bond Street: of the first, only two other copies are known to exist—one of which is not perfect—and of the second, there are two sound and two imperfect copies. They are respectively "*The Treasvri of Helth* contaynynge many profytable medicines, gathered out of Hipocrates, Galē and Auicen by one Petrus Hyspanus and trāslated into Englysh by Hūfre Lloyd who hath added therunto ye causes and sygnes of euery dysease, w the Aphorismes of Hipocratz, and Jacobus de Partybus . . . wyth an Epistle of Diocles vnto Kyng Antigonus. . . ." Blackletter, "Imprinted at London in fletestrete at the signe of the Rosegarlād by Wyllyam Coplande" (? 1550). The author is stated to be John XXI (Pedro Giuliano-Rebulo), and the auctioneers state that his identification with Petrus Hispanus, a celebrated Portuguese physician and philosopher, is probably correct. The other is dedicated to William Cecil, afterwards the great Lord Burghley, under date January 1, 1551. It is the work of Henry Wingfield, entitled "*A Compendious or Shorte Treatise,* gathered out of the chyefe and principall Authors of Phisycke, conteynynge certeyne preceptes necessary to the preservacion of healthe, and long continuance of the same: verye pleasaunte and profitable to reade . . . imprinted at London by Robert Stoughton, dwellynge wythin Ludgate at the sygne of the Bishoppes Myter, 1551." Bound together, these two rare and quaint medical pamphlets are certain to cause keen competition amongst collectors; they are being sold on behalf of Lord Boston, but no indication is given of their provenance before they came into his possession. In the same sale (on August 1) there comes up for disposal a copy of the *Antidotarius Animae,* by N. de Saliceto, published at Haguenau, 1494.

ANNALS OF MEDICAL HISTORY

The six main articles in the November number of the *Annals of Medical History*[1] range widely. At one end of the scale is a paper comparing the American medicine man with the Asiatic shaman by Dr. C. Quinam, and another on medical practice among the aborigines north of Mexico, in which Dr. R. C. Major of New Orleans draws attention to the freedom of some Indian tribes from gout, renal calculi, scrofula, and dropsy. At the other extreme is Dr. W. S. Middleton's account of Dr. S. P. Griffitts, a Quaker physician of Philadelphia, who died in 1826, probably of acute coronary obstruction, and of whom Weir Mitchell wrote: "Wherever he went and whatever he did peace and gentleness were round about him." Dr. Anne Tjamsland contributes an extremely interesting account of Niels Stensen, whose name was Latinized to Niçolaus Stenonis, often shortened to Steno on the erroneous assumption that Stenonis was the genitive case of a name Steno. Dying at the early age of 48, he took all knowledge and most languages as his province; he gave up science for the Catholic Church when 35, was described by Voltaire as "the greatest man that ten centuries have produced," and a year after ordination he was made Bishop of Titiopolis *in partibus infidelium.* Professor R. H. Major of Kansas writes authoritatively on Karl Vierodt, who ninety years ago correctly estimated the number of the red blood cells, and advised his students to make it a rule to say as rarely as possible, "I have lost a day." Dr. T. Gibson, the authority on Sir Theodore de Mayerne, reproduces that court physician's report on the illness, death, and necropsy of Henry, Prince of Wales, in 1612. Sir Norman Moore in 1881 pointed out that the disease was typhoid fever. Among the book reviews is one on W. R. LeFanu's *British Periodicals of Medicine,* which is deservedly described as an invaluable source of reference.

[1] *Annals of Medical History.* New Series, Volume X, No. 6. November, 1938. Edited by Francis R. Packard, M.D. (Pp. 463–570; illustrated. Subscription for the year 11 dollars; single number 2.50 dollars.) New York: Paul B. Hoeber Inc.; London: Book Department, Harper and Brothers. 1938.

ALEXANDER POPE

A fascinating medico-psychological case, Alexander Pope, the 250th anniversary of whose birth happened last year, was intimately associated, both professionally and personally, with the most eminent medical men of Queen Anne's reign. It was Radcliffe who successfully treated him for a nervous breakdown at the time of puberty. All his life Pope was in the hands of physicians, whom he changed frequently, sometimes having three or four at once. In 1735 he was a patient in the home of Cheselden, whom, together with Mead and Douglas of the "soft obstetric hand," he has immortalized in verse. Inordinately fond of quacks, he publicly defended Joshua ("Spot") Ward of "drop and pill" notoriety. About four feet high, with a severe rachitic kyphoscoliosis, the poet was so weak that he could not dress or undress himself unaided. Subject to terrible headaches, which he tried to assuage by drinking coffee, he was also afflicted with dyspepsia, occasioned by his love of liqueurs and highly seasoned foods, his pet dish being potted lampreys. In this frail body dwelt a twisted, waspish mind. Ironically enough, his polemics, masterpieces of accumulated venom, are still read by many who find his more lasting contributions to English literature unreadable. There was held this year at New York's Grolier Club (named after the French bibliophile Jean Grolier de Servières) a carefully planned exhibition of Pope's poetry and polemics, which included a number of well-nigh extinct pamphlets.

Lady Mary Wortley Montagu Recalled

There were many reminders of Pope's friendship—so soon to end in shipwreck—with the Lady Mary Wortley Montagu. An autograph letter written by the poet to Lady Mary, while she was *en route* to Constantinople with her ambassador husband, bears witness to his infatuation with her dazzling personality. It was on her return to England that she imported into Europe the practice of inoculation for small-pox. An exquisite manuscript copy was displayed of her poems *Court Eclogs,* which her admirer had transcribed for her. A copy of *Court Poems* recalls that, because Edmund Curll had published this volume of the noble lady's verse without permission, Pope gave him an emetic in a glass of wine. "The Capon's Tale" in the last volume of *Miscellanies* contains the satirist's first known attack on the Lady Mary after she had fallen from grace.

In "An Epistle . . . to Dr. Arbuthnot" Pope gives an intimate account of "that long disease his life," while the "Memoirs of . . . Martinus Scriblerus" (an imaginary pedant and relative of Dr. Dryasdust) serve to recall his association with Arbuthnot and Swift at the Scriblerus Club. An inscribed presentation copy of his *Works* to Anne Arbuthnot reminded us that the daughter of Queen Anne's physician was one of Pope's best friends in his later years. An amusing item exhibited was a pamphlet "letter" in which the poet's bitter enemy, Colley Cibber, tells of how he rescued Pope from venereal dangers in a "house of carnal recreation."

W. R. B.

In his recent thesis on Robert Schumann's disease (*Thèse de Paris,* 1939, No. 182) Dr. Henri Gilbert maintains that the great pianist, who came of a neuropathic family, was the subject of cyclothymia, the onset of which occurred at the age of 21. During the twenty-five years of his professional activity, however, his music showed no signs of dementia or even mental deficiency, so that the view held by Moebius that Schumann was the subject of either dementia praecox or general paralysis is untenable. The necropsy after his death on July 29, 1856, at the age of 46 was confined to a naked-eye examination, and merely showed senile changes.

ROYAL NATIONAL ORTHOPAEDIC HOSPITAL

NEW TREATMENT BLOCK AT STANMORE

In 1838 W. J. Little founded an orthopaedic dispensary in Bloomsbury which, after two years, developed into the first orthopaedic hospital in London. Very soon better accommodation was found to be necessary, and the hospital moved to Hanover Square, and in 1845 a Royal Charter was granted, the institution being named the Royal Orthopaedic Hospital. As interest in orthopaedic surgery grew a second hospital was founded in Hatton Garden in 1851, and was called the City Orthopaedic Hospital. In 1865 yet another hospital was opened — namely, the National Orthopaedic Hospital, which was built on the now familiar site in Great Portland Street. These three institutions continued to exist separately until 1905, when, at the suggestion and with the help of King Edward's Hospital Fund, they amalgamated; thus the Royal National Orthopaedic Hospital came into being.

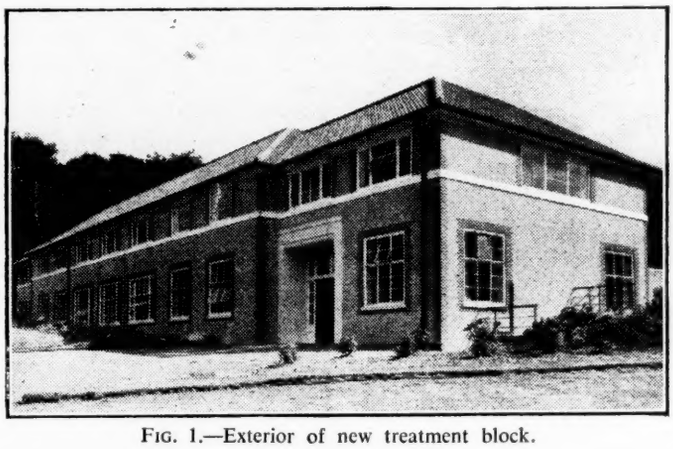


FIG. 1.—Exterior of new treatment block.

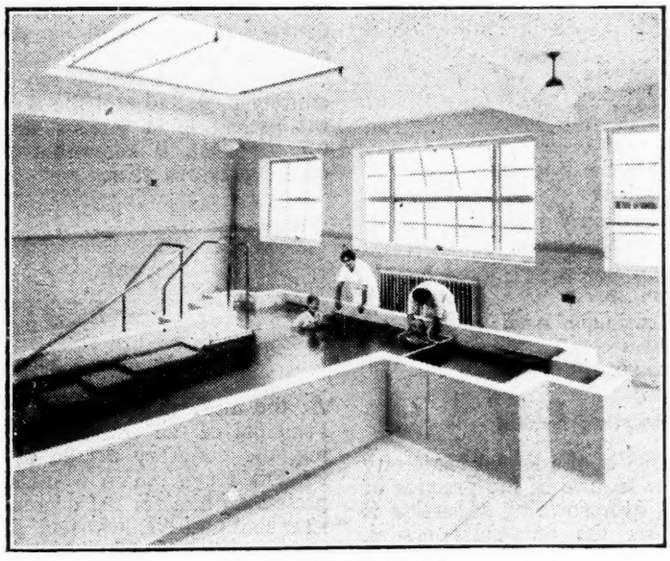


FIG. 2.—Treatment pool.

The Country Branch

The Committee of Management quickly realized the importance of establishing a country branch, where certain patients could receive the benefits of the fresh air and sunshine of the open country. In 1922 the problem was solved by the purchase of the Mary Wardell Home at Stanmore, Middlesex, and in this way the country branch was born. At first it appeared a puny child; there were only thirty-four beds, and all the work, operating, radiography, and the rest was done in the rooms of a Victorian country house. But the growth of the hospital has been phenomenal—in its class perhaps unique. There is now accommodation for 276 patients, with a convalescent block for another forty-four, and a training college for 112 boys handicapped by some permanent crippling defect.

Means of Physical Treatment

With this rapid growth came the necessity for enlarging the facilities for physical treatment, and particularly for the victims of poliomyelitis, who have been admitted in increasing numbers during recent years. The provision of a pool for under-water remedial exercises was considered essential; such pools exist in a number of hospitals in this country, and have long been a feature of orthopaedic hospitals in the United States and Scandinavia, where poliomyelitis is a constant and serious problem. The principle underlying this form of treatment is too well known to call for discussion here. The essential features of such a pool are that it shall contain warm water and be easy to manage.

The pool at Stanmore has been designed to make the task of the masseuses as light as possible. The sides of the pool come well above the floor level, there is a central deep trough for adult patients, and two bays for the treatment of infants. The corners of the bays are indented so that the masseuse can lean over the child without undue discomfort. The capacity of the pool is approximately 2,500 gallons; the temperature of the water is maintained at 90° F. by thermostatic control; the circulation is continuous, and the water is filtered and treated with alum. Adjoining the pool are cubicles where patients may be sprayed with hot or cold water, dried, and given massage and exercises.

The other features of the treatment block are a large gymnasium which can also be used as a lecture room, a light-treatment room containing Hanovia lamps, a large massage room more than sufficient for the present needs of the hospital, a dental room (dentistry is an important part of treatment in long-stay cases), and a small lecture room, which is also used as a pathological museum. On the first floor is a large central linen room sufficient to contain the linen for the whole hospital. There are over three hundred cupboards, and each is aired by warm water circulating through pipes placed between adjoining cupboards; there is also a blanket store, sorting and receiving rooms.

The cost of the block is £17,000. A generous donation of £5,000 from the executors of the late Caleb Diplock enabled the work to be started. It was their wish that the money should be devoted primarily to the construction of the swimming pool, and the Committee of Management wisely decided to erect a larger building for all the departments dealing with physical treatment, though this has meant waiting until other funds became available.

The building was opened by Mrs. Walter Elliot, wife of the Minister of Health, on Wednesday, July 19.

The fourth International Congress, under the auspices of the Société Européenne de Chirurgie Structive, will be held in Paris on October 5, 6, and 7. The honorary president of the congress is Professor P. Sebileau, member of the Academy of Medicine of Paris, and the president Doctor L. Dufourmentel. The two main discussions will be on (*a*) treatment of destructions and deformities resulting from scar retraction of the eyelid, and (*b*) treatment of deformities of the jaw. Other communications will be strictly limited to subjects which come within the scope of structive and plastic surgery. Plastic operations will be performed during the congress, and a programme of entertainments and a banquet is being drawn up. Information concerning the reductions which are available for the journey and the stay in Paris may be had from the secretary of the congress, Maison de Chirurgie, 9, Rue de Turin, Paris.

Local News

IRELAND

Memorial to Professor A. F. Dixon

It is almost three years since the death of Andrew Francis Dixon, professor of anatomy and dean of the faculty of physic in Trinity College, Dublin. Now his long and faithful services to his Alma Mater have been fittingly commemorated by the erection of a hall in the College Park dedicated to his memory and designed for the use of the medical school in which he was both student and teacher, and which he loved so well. The Dixon Hall, which was opened this month by the Provost of Trinity College, is unique in being the only one of the College buildings to bear a person's name. That such an honour has been paid to Dixon shows the affection and regard which he inspired in his colleagues and students. The hall stands midway between the schools of botany and physics. Its architect, Mr. F. G. Hicks, has broken away from the older tradition, as seen in the majority of the College buildings; his design is frankly of the twentieth century. The severity of its front of granite from the Dublin hills which Dixon loved is relieved by two sculptured nude figures representing "Wonder" and "Aspiration," and by the conjoined arms of Trinity College and the Royal College of Physicians of Ireland. The main feature of the interior of the hall, which accommodates about 350 persons, is the plaque which, in golden letters, commemorates a worthy son of the College for those who, in years to come, had not the privilege of being his pupils, colleagues, or friends:

MEMORIAE PERPETVAE
ANDREAE FRANCISCI DIXON
QVI PER TRIGINTA TRES ANNOS
CATHEDRAM ANATOMIAE DECANATVMQVE
FELICITER OBTINVIT
SCHOLAM MEDICAM MIRA PRVDENTIA EXCOLVIT
DOCTRINA ADORNAVIT SPLENDIDISSIMA
HOC MONUMENTUM AMORIS
OPIBVS COLLEGII ADIVTI
COLLEGIAE DISCIPVLI CETERIQVE AMICI
DEDICAVIMVS
A.D. MCMXXXIX

Royal Maternity Hospital, Belfast

The Registrar's report for 1938 of the Royal Maternity Hospital, Belfast, records a new feature in the practice of the hospital. To avoid serious overcrowding admission is refused to multiparae attending the ante-natal clinics, unless some definite abnormality of pregnancy is present. This has resulted in a diminution in the number of normal cases admitted, and a rise in those which are abnormal. The mortality rate was 0.92 for 1,994 total admissions, 0.31 for ante-natal admissions, and 3.8 for emergency admissions. The report gives a very complete summary of each of the eighteen fatal cases. The morbidity rate for the year was 4.7 per cent. This rate is estimated according to the following standard: "A rise of temperature during the first eight days of the puerperium, exceeding 100° F., on any two occasions, irrespective of the pulse rate, and excluding the first twenty-four hours after delivery." An analysis of sixty-two morbid cases shows nineteen of infection of the urinary tract, thirteen of puerperal sepsis, and ten of mastitis. Among more unusual conditions may be mentioned one case of lobar pneumonia with focal necrosis of the liver, one of epithelioma of the oesophagus, and one of Wernicke's encephalopathy. The appended district report states that 712 patients were confined in their own homes. At the ante-natal clinic the number of new patients was 2,285, and the total number of examinations 11,604; the comparable figures at the infant clinic were 512 and 2,591.

Dublin National Maternity Hospital

The clinical report for 1938 of the National Maternity Hospital, Dublin, records, as the event of the year, the completion of the final section of the building. During the earlier months it was necessary to refuse admission to seventy-nine patients in labour, but the present accommodation—145 beds—has proved to be sufficient, and has greatly facilitated the working of the hospital. A new feature of interest is a nursery for the management of delicate infants. Patients admitted to the maternity department in the year numbered 2,964, of whom 2,568 were delivered, while a further 705 patients were delivered in their homes. The total figure of patients delivered—3,273—constitutes a record. The report states that the year was notable for the increase, both relative and actual, in abnormal conditions. There were forty-seven persistent occipito-posterior presentations, fourteen of face and brow, 123 breech, sixteen transverse (with five foetal deaths), and sixteen cases of prolapse and presentation of cord. Cases of accidental haemorrhage numbered thirty-five, and of placenta praevia twenty-two. The incidence of albuminuria was comparatively high, 491 patients having albumin + 1 or more; fifty-seven of these showed more or less severe toxic symptoms, and in many cases induction of labour was necessary. In addition, a large number of patients suffering from phthisis, hyperemesis, toxaemia, and cardiac disease gave rise to considerable anxiety on account of the severity of their condition. Fifteen patients died after delivery in the hospital and three died undelivered. Many of these were emergency admissions, in some cases from country districts, where too frequently ante-natal care is entirely neglected and the doctor is only summoned when the patient is in serious straits. The mortality rate of 0.7 per cent. is somewhat higher than the low record of the previous year.

SCOTLAND

Edinburgh Medical Graduation

At the medical graduation in Edinburgh on July 19, the Principal of the University, Sir Thomas Holland, presiding, the honorary degree of LL.D. was conferred upon Francis Hugh Adam Marshall, C.B.E., D.Sc., F.R.S. In presenting him for the degree, the Dean of the Faculty of Law said that Dr. Marshall was reader in agricultural physiology at Cambridge and was a pioneer in the field of reproductive physiology, to whom was largely due the creation of a British school in this department. His researches extended over forty years, during which time he had published some sixty papers on animal nutrition, breeding, and reproduction, and his textbook on *The Physiology of Reproduction* had now reached a third edition. The degree of doctor of medicine was conferred upon fourteen graduates, among whom was Dr. H. L. de Waal, who was awarded a gold medal for his thesis upon "Bacteriological and Epidemiological Studies of Streptococcal Infections." The degrees of M.B. and Ch.B. were conferred upon 148 graduands. Professor Charles McNeil, of the chair of child life and health, in an address to the graduates, referred to criticisms of medical education and the change in the curriculum which was planned in the University of Edinburgh. He said that the rapid and healthy growth of medical knowledge had created the need for changes in methods and technique of teaching

and for an extension of the period of study. The chief danger in medical teaching was that more intellectual food might be administered than could be digested. The golden rule of medical teaching should be to attend to understanding and let memory take care of itself. At the same ceremony Sir Thomas Holland presented the first two certificates for physical proficiency to be granted by the university. [An account of Edinburgh's physical training course for students studying for academic degrees was given in the *Journal* of July 8, page 86.]

Local Authorities and Treatment of Cancer

A circular on the Cancer Act, 1939, which has been issued by the Department of Health for Scotland points out that under this Act local authorities are required to make arrangements to secure that the facilities for treatment of persons suffering from cancer are adequate, and to submit such arrangements for the approval of the Department of Health before March 29, 1940. Experience in the south-eastern region of Scotland, the circular continues, shows that about 25 per cent. of persons suffering from cancer do not seek treatment until their condition is hopeless, and of the remainder some 40 per cent. seek treatment so late that the prospect of cure is seriously prejudiced. Local authorities should therefore provide diagnostic facilities either themselves or by arrangement with a local voluntary hospital. It is not anticipated that any considerable provision of hospital beds will have to be made, and it is not necessary in any case that the local authority should themselves undertake to do this. The appropriate course would usually be to arrange with voluntary hospitals as to the direction and extent of desirable developments, and to assist those hospitals to carry them out. Local authorities are empowered to pay travelling expenses reasonably incurred by patients, and these, as well as payments towards capital cost of additional accommodation in hospitals or for the maintenance and treatment of patients, will be defrayed with the help of an Exchequer grant of 50 per cent. Before submitting their arrangements to the Department of Health the councils must consult, among others, the medical and surgical staffs of the local voluntary hospitals and such local organizations of medical practitioners as they consider to represent medical opinion in their areas. Attention is drawn to Section 4 of the Act, which prohibits advertisements for treatment of cancer, which, however, does not apply to advertisements published by a local authority or by a voluntary hospital.

ENGLAND AND WALES

The Merseyside Hospitals

An account of the many community services of the Merseyside Hospitals Council is given in the annual record of that body for 1938, a year which saw an increase in contributors to the penny-in-the-pound fund of about 20,000 and brought the number of contributors up to 355,000. During the year £167,138 was distributed to medical institutions, an increase of £9,012 over the previous year. It is pointed out that the distribution to the associated hospitals of Merseyside represents about one-third of their annual ordinary income, but these distributions from the fund are £50,000 below the actual cost of the voluntary hospital services provided to contributors to the fund and their dependants. One of the unsolved problems is how to procure more generous support from the owners of multiple shops whose headquarters are in London, and from contractors operating from other cities and engaged on long and short contracts on Merseyside. Statistics show that the incidence of sickness on many of these local contracts is high, and the cost of providing hospital services in Merseyside voluntary hospitals to their employees far outweighs the amount of contribution received. This problem is acute in the shipping industry ; over a period of seven years the shipping and dock employees have cost the local voluntary hospitals £259,570, while the total income from the industry (employers and employees) was £138,770. The council's aim is to make the great industrial community of Merseyside fully conscious of its responsibility for the efficient upkeep of the essential hospital services.

Harrogate and Rheumatism

Harrogate claims that by the erection of the new spa buildings at a cost of nearly £100,000 she is contributing in no small way towards the relief of rheumatism, as well as many other disorders which are amenable to spa treatment. A rheumatism research fellowship has been established in Harrogate by collaboration between the Harrogate Corporation, the University of Leeds, and the Royal Bath Hospital. A whole-time research worker has been appointed, and day in and day out research into the causes and treatment of rheumatism is being carried out. The Corporation also employs a whole-time scientific officer, whose duties are mainly concerned with research into the various waters and treatments, and the best method of applying them. The new building which has been erected and was recently opened by the Lord Mayor of London is capable of providing 1,000 treatments a day, all of which embody in one form or another the natural mineral waters of the spa. Harrogate has also introduced an "all-inclusive cure ticket," through which medical attention and all baths, waters, and treatments required for a complete course are obtainable at fixed charges of 5 guineas for two weeks or 7 guineas for three weeks. In addition, most of the hotels in the town are co-operating with the Corporation by quoting reduced fees for patients coming to Harrogate under the new scheme.

Queen Charlotte's in 1938

The clinical report of Queen Charlotte's Maternity Hospital for 1938 states that 3,815 patients were delivered during the period under review: 1,684 of these were primigravidae. The number of maternal deaths was eleven, ten among booked patients and one, caused by an infected hydatidiform mole, among the emergencies. The mortality rate for booked cases exceeded that for emergency cases—an unusual statistical feature. The report includes a short summary of each fatal case. With regard to the incidence of haemolytic streptococcal infection it is recorded that only one Group A infection occurred among 2,441 booked and emergency cases. This is the lowest incidence since the practice of distinguishing between Group A infections and those due to other groups was established in 1935. The sole case was a woman who developed peritonitis following a Caesarean section, and it was not possible to trace the source of infection. In striking contrast to this low incidence of Group A haemolytic streptococcal infection among the hospital cases no fewer than sixteen occurred among the 1,374 women delivered in the district, an incidence of one in eighty-six. None of these cases was very severe and there was no suggestion of an epidemic. Throat and nose swabs from doctors and nurses attending proved negative, and it is suggested that the infections were probably attributable to streptococci transferred indirectly, possibly by dust, from the mother's family and friends, or from the throat and nose of the mother herself. It appears from the above figures that the homes of the district patients represent a much more highly streptococcus-infected environment than the hospital, involving risks from which even the most careful antiseptic and aseptic technique cannot adequately safeguard the patient.

Correspondence

Diphtheria Immunization

SIR,—In October, 1936, a whole-time medical officer began immunization against diphtheria in the city of Belfast. In addition to this medical practitioners were given the material free where they wished to carry out immunization themselves. The number of immunizations effected by medical men is very small in proportion to the total accomplished.

It is generally held that about 50 per cent. of the entire population, say between 1 and 14 years of age, must be immunized before any results are noted. Since the beginning of this work in Belfast 20,000 children between these ages have been immunized. We find it much easier to get the parents to agree to carry out the immunization of children of school age rather than of those we particularly want—namely, the younger children. The total immunized works out, in round figures, at about 20 per cent. of all children between 1 and 14 years of age.

I have taken the second quarter of the year for the last five years and have worked out the number of notifications of diphtheria during that period, in those years, with the following results:

2nd quarter of	1934	.. .. ..	195 cases
,,	1935	.. .. ..	239 ,,
,,	1936	.. .. ..	242 ,,
,,	1937	.. .. ..	166 ,,
,,	1938	.. .. ..	138 ,,
,,	1939	.. .. ..	78 ,,

The population of the city is approximately 439,000 people. It would seem, therefore, that from the presence of a block of 20,000 immunized children in the city there is an influence at work. I have not looked up the records of the city for the last fifty years (the amount of A.R.P. work we have to do makes it impossible for me to spare the time), but I very seriously doubt whether there has ever been such a low incidence of diphtheria in any second quarter of the year. One thing is certain: that as in the case of other cities and towns, in the last eight or ten years the notifications of diphtheria have gone up considerably as a result of "positive swabs" in the case of ears and nares, etc.

It certainly makes one happy at the week-end, when counting up the numbers of cases of notified diphtheria during the week, to find that in the last four years the weekly numbers are one-half to one-third less than they were in recent years.—I am, etc.,

CHARLES S. THOMSON,
Medical Superintendent Officer of Health.

Belfast, July 17

Prevention and Treatment of Shock

SIR,—Your correspondent H. K. Ashworth in his letter (July 22, p. 196) emphasizes the failure of spinal anaesthesia in shocked patients during the war, but misses a very important point, which in my opinion was responsible for that failure.

It is essential that patients under spinal anaesthesia should be kept with the head lower than the buttocks during the whole period of anaesthesia, and for some time afterwards; the reason for this being that one of the results of spinal block is to allow the blood to drain into the great muscle areas and abdominal viscera uncontrolled by the vasomotor nerve centres. If the patient is kept head down this drainage of the blood is prevented and the pressure is maintained in the essential part of the circulation—the heart, lungs, and brain.

During the war all wounded were treated on army stretchers and were kept flat, or more often with the head raised, and it was this position which caused all the trouble. Spinal anaesthesia will prevent shock in badly wounded men if the patient is kept rigidly head down for some hours after the administration of the anaesthetic. Very few persons would survive a high spinal anaesthetic if sat up immediately, even if unwounded, as the blood would drain out of the essential part of the circulation.—I am, etc.,

London, W.1, July 24. J. P. LOCKHART-MUMMERY.

Storage of Blood for Emergency

SIR,—The consensus of opinion is in favour of the use of stored citrated blood in times of emergency. Since this method involves both refrigeration and transport, it was thought advisable to study the effects of temperature and shaking, particularly on the red cells.

Approximately 400 c.cm. of blood from six normal volunteers was collected into six separate McCartney bottles fitted with metal screw caps with rubber centres, containing 100 c.cm. of 3.8 per cent. sodium citrate solution. Three bottles were kept in the refrigerator at 3° C. and three at a temperature of 22° C. One bottle from each group was vigorously shaken for three hours daily for the first ten days in a rotatory mechanical shaker revolving one hundred times a minute. Samples were withdrawn at weekly or daily intervals and the following investigations carried out: (1) the mean red cell diameter by a modification of the halo method; (2) the red cell count; (3) the degree of haemolysis, measured by the iron content of the whole citrated blood immediately after collection, and subsequently of the supernatant plasma after centrifugation; (4) spectroscopic examination of the red cells and of the plasma for abnormal blood pigments; (5) red cell fragility; (6) aerobic and anaerobic culture for sterility. All samples remained sterile for forty-five days, after ten days' incubation at 37° C.

1. The first change to occur was a diminution in the mean cell diameter (M.C.D.) of the red cells, visible at seven days, and which continued to progress until the twenty-fourth day, when the M.C.D. appeared to remain constant at about 6.2 μ. No further reduction in size was visible from the twenty-fourth to the forty-fifth day.

2. The red cell counts remained constant within the limits of experimental error in the samples kept at 3° C., there being no reduction at the end of forty-five days, while the proportion of "ghosts" remained the same. In the samples kept at 22° C. there was a moderate reduction in the total red cell count (including "ghosts") of 10 to 25 per cent. of the original count, from the twenty-eighth to the forty-fifth day, with a progressive increase in the number of "ghosts."

3. (*a*) *The effect of shaking.* Slight haemolysis occurred at both temperatures on the seventh day in the shaken samples but not in those at rest. From the seventeenth day onwards no difference in the degree of haemolysis could be detected between shaken and unshaken specimens. (*b*) *The effect of temperature.* In the group kept at 3° C. the haemolysis was 1 to 3 per cent. at the twenty-eighth and became progressively higher, reaching 6 to 20 per cent. on the forty-fifth day. In the group kept at 22° C. haemolysis was first recognizable at the seventh day; it was 7 to 10 per cent. on the fifteenth day, and steadily increased, reaching 40 to 65 per cent. on the forty-fifth day.

4. Methaemoglobin was the only abnormal blood pigment detected, and first appeared in the 22° C. group on the twenty-second day. No methaemoglobin or other abnormal pigment was seen in any sample kept at 3° C. throughout the period of experiment.

5. The red cells began to show an increased fragility at seven days, which progressively increased in all samples.

What is the interpretation of the above data? Although correlation between each different phenomenon is difficult owing to the small number of samples in each group, certain positive facts emerge. The first changes, to be seen at seven days, are a reduction in the M.C.D. and an increased fragility, which are unaccompanied by any haemolysis or any marked anisocytosis. Both changes progressively increase until the M.C.D. becomes stable at about 6.2 μ.

The reduction in the M.C.D. and its maintenance at the reduced figure is possibly due to the cells assuming a spherical shape. These changes are common to both groups. As for haemolysis, which is likely to determine the rejection of any particular batch of stored blood, room temperature (22° C.) both anticipates and accelerates the degree of haemolysis, and is therefore out of the question for purposes of storage; but since no haemolysis occurs for the first seven days, a short period at room temperature (which may be forced by the exigencies of the situation) should not be detrimental. Storage at 3° C., however, may be prolonged much further, since the haemolysis at thirty days is no more than 1 to 3 per cent. of the total, and the liberated pigment is unaltered haemoglobin, while the number of red cells is not diminished, though a few "ghosts" are present. Though such "ghosts" are useless as oxygen carriers, provided they are not deleterious they should still be capable of maintaining viscosity. As for shaking, the procedure adopted was much more vigorous than what is likely to occur under "field" conditions; it would appear that while shaking anticipates haemolysis by ten days, it has no influence on its rate or final degree; nor does it cause any diminution in the number of red cells. In this connexion it is interesting to find that haemolysis is not accompanied by disappearance of red cells, which, apart from a reduction in the M.C.D., are devoid of any crenation or appreciable anisocytosis for as long a period as forty-five days of storage. The above data suggest that the sequence of events leading to haemolysis is, first, a reduction in the M.C.D., possibly due to a change in form of the red cell from a biconcave disk to that of a sphere, and then a seeping through of haemoglobin from the cell, which remains as a "ghost." Whether such "ghosts" have any deleterious effect on injection can only be decided by experiment.—We are, etc.,

Department of Pathology, Guy's Hospital Medical School, July 24.

S. DE NAVASQUEZ.
R. L. WATERFIELD.

Blood Transfusion Service for War

SIR,—In your issue for July 15 (p. 121) there is an annotation upon this subject in which mention is made of the risk of syphilis being transferred from an infected donor to a healthy recipient. That risk is a very real one, and, so far as can be ascertained, there are few blood transfusion empanelling centres in which examination of volunteer donors for syphilis is carried out as a routine.

In a letter to the *Daily Telegraph* on July 6 Lord Dawson of Penn stated: "All that is required of volunteers now is a few drops of blood to enable a grouping test to be made." That, however, is not nearly enough. At the time the grouping test is done it is necessary that the volunteer should undergo a thorough clinical examination by a syphilologist, and that a specimen of blood should be submitted to the Wassermann and Kahn tests. Only after these investigations have yielded negative results in respect of syphilis should the volunteer be placed upon the list of potential donors. Positive clinical or serological findings would exclude the volunteer as a blood donor. When the time comes for any volunteer on the list to provide a specimen either for immediate transfusion or for storage, there should again be carried out a clinical and serological examination before the specimen is used. Since 1915 the following authors have reported cases of transfusion syphilis:

(1) Fordyce, J. A., *Amer. J. med. Sci.*, 1915, **149**, 781; (2) Bernheim, B. M., *Blood Transfusion*, 1917, J. B. Lippincott Co., p. 62; (3) Brem, W. V., *J. Amer. med. Assoc.*, **81**, 532, (two cases); (4) Spillman, L., and Morel, V., *Bull. Soc. franç. Derm. Syph.*, 1926, **33**, 453; (5) Levy, I. I., and Ginsburg, L., *Amer. J. Syph.*, 1927, **11**, 447; (6) Feldman, V., *Rev. franç. Derm. Vénér.*, 1928, **4**, 341; (7) Dufour, H., *Bull. Mém. Soc. méd. Hôp. Paris*, 1924, **45**, 511; (8) Tzanck, A., ibid.; Marshal, A., ibid.; (9) Schulmann, E., *Prat. Med. franç.*, 1929, **8**, 393; (10) Constantinescou, E., and Vatamann, N., *Ann. Mal. vénér.*, 1929, **24**, 161; (11) Aubertin, C., and Fleury, J., *Bull. Mém. Soc. méd. Hôp. Paris*, 1930, **54**, 69; (12) Gougerot, H., *et al.*, *Ann. Mal. vénér.*, 1931, **26**, 174 (three cases); (13) Polayes, S. H., and Lederer, M., *Amer. J. Syph.*, 1931, **15**, 72; (14) Cordiviola, L. A., *Semana méd.*, 1932, **39**, 43; (15) Pinard, M., and Robert, P., *Bull. Mém. Soc. méd. Hôp. Paris*, 1932, **48**, 214; (16) Post, C. D., and Cooney, G. C., *J. Amer. med. Ass.*, 1933, **100**, 258; (17) Cummer, C. L., *Amer. J. med. Sci.*, 1933, **185**, 787 (two cases); (18) Williamson, G. R., and Strong, R. A., *Amer. J. Syph.*, 1933, **17**, 484; (19) Minanu, S., and Asabi-Fukuoka, *Derm. u. Urol.*, 1933, **1**, 27; (20) Moore, J. E., *Modern Treatment of Syphilis*, 1933, C. C. Thomas Co., p. 456 (three cases); (21) Pinard, M., *Bull. Mém. Soc. Méd. Hôp. Paris*, 1934, **50**, 416 (three cases); (22) Carnot *et al.*, quoted in *J. Amer. med. Ass.*, 1934, **101**, 1773; (23) Garner, V., *Arch. Derm. Syph.*, 1934, **30**, 480; (24) Jones, H. W., *et al.*, *Amer. J. Syph.*, 1935, **19**, 30 (four cases); (25) Morgan, H. J., *Amer. J. med. Sci.*, 1935, **189**, 808; (26) Périn, M. L., and Lefevre, M., *Bull. Soc. franç. Derm. Syph.*, 1935, **42**, 954; (27) Mandelbaum, H., and Saperstein, A. N., *J. Amer. med. Ass.*, 1936, **106**, 1061; (28) Pautrier, L. M., *Bull. Soc. franç. Derm. Syph.*, 1936, **43**, 503; (29) Klander, J. V., and Butterworth, T., *Amer. J. Syph.*, 1937, **21**, 652; (30) Rein, C. R., *et al.*, *J. Amer. med. Ass.*, 1938, **110**, 13.

This gives a total of over forty cases of transfusion syphilis occurring under peace-time conditions, and probably a great many more instances have occurred but have not been diagnosed as such. It is obvious that if, as Lord Dawson states in his letter, one out of every ten persons wounded in air raids requires blood transfusion, the danger under war-time conditions will be very much greater unless the most careful measures are taken to eliminate syphilitic donors. In most instances it would appear that the donors causing transfusion syphilis were in the latent phase of the disease and were quite unaware of their infection. In some instances the donors were serologically negative, being in the pre-chancre or incubation stage of syphilis. There are certain points to which I would particularly direct attention.

1. The Wassermann test will detect only the most obvious risks of infection.

2. The presumptive precipitation test, such as the Kahn, should be the test of choice since it is more sensitive and more easily and quickly applied than the Wassermann in emergency.

3. A thorough physical examination, carried out by an experienced syphilologist, should be made of every donor before being put on the list and again before a specimen is taken for storage or immediate transfusion, in addition to a Wassermann and/or presumptive Kahn test.

4. Clinical examinations and serological tests done at intervals are valueless.

5. Donors should be most carefully selected from persons of the highest moral and of satisfactory social status in order to minimize so far as possible the use of blood from a person in the incubation period of syphilis.

In the annotation already mentioned it is stated: "In any event the risk here [of syphilis] is borne by the recipient and not the donor." There are, however, several cases on record where the donor has been infected by the recipient owing to cannulas being inadvertently exchanged, and to other errors of technique. With stored blood this danger ceases to exist; but in all direct transfusions carried out in normal times for conditions such as haemorrhage or aplastic anaemia the donor ought to be as well assured of protection against accidental syphilis as is the recipient. It would be interesting to have the medico-legal position with regard to these matters authoritatively clarified.—I am, etc.,

E. T. BURKE,
Director, L.C.C. (Whitechapel) Clinic.

London, E.1, July 18.

Gastric Findings in Dyspepsia

SIR,—Dr. Ernest Bulmer's paper on a gastroscopic study of radiologically negative dyspepsia (July 15, p. 108) is of great interest to radiologists. The fourth table of cases shows that in a series of 147 cases *x*-rayed and found to be negative eight gastric ulcers were missed, in spite of modern and expert radiological technique. It would be interesting to learn if, as I suspect, these ulcers were shallow erosions, or whether any chronic ulcers remained undetected by the barium meal.

A much larger group is that of chronic gastritis, comprising nearly half the series. This wide disparity between gastroscopic and radiological findings indicates that further combined investigation by both methods may be necessary. It also raises the question whether radiologists may not be too rigid in their diagnostic criteria of gastritis; whether lesser degrees of disturbance of the gastric mucous pattern should not receive more attention than they receive at present; or whether, on the other hand, the common type of gastritis found by the gastroscope (chronic superficial gastritis) gives no radiological signs. Does Dr. Bulmer consider this last type hyperchlorhydric in origin; in other words, is it the precursor of actual ulceration? If so, I should have expected it to give definite radiological signs prior to ulceration.

Finally, it is interesting to note that chronic appendicitis does not appear as a cause of any of these cases of dyspepsias of unknown origin.—I am, etc.,

London, W.1, July 17. S. COCHRANE SHANKS.

Chance in Medicine and Research

SIR,—In a series of papers published in the last three years we have brought forward evidence which shows that prolonged administration of oestrogens affects the endocrine system generally. For reasons that need not be detailed here, the degenerative change in the adrenal glands produced by oestrogens was of particular interest from the point of view of carcinogenesis in the mamma. The investigation of the reaction of adrenalectomized mice to oestrogens was therefore a logical step in the study of the complex interactions in the endocrine organs accompanying the development of mammary cancer by oestrogens.

The results of this investigation were described by us in a recent paper (*Lancet*, 1939, **1**, 192). Excision of the adrenal glands makes mice resistant to the physiological effects of oestrogens: atrophy of the testis and of the thymus, arrest of growth, loss of weight, changes in the pituitary, and hyperplasia of the mamma are all diminished or thereby prevented. It was also found that the administration of oestrogens before adrenalectomy enabled the mice to withstand the effects of this operation better than those not so treated. The following table abbreviated from Table I of our paper comprises the evidence of the effect of a preliminary oestrinization on the mortality from adrenalectomy.

	Adrenalectomy Alone			Adrenalectomy after Oestrinization		
	M.	F.	Both Sexes	M.	F.	Both Sexes
Total number of mice	8	16	24	19	13	32
Survived	4	9	13	15	11	26
Percentage survival	50	56	—	79	85	—

The group under the heading of "adrenalectomy alone" is described in the text as the control group. In our paper we comment on Table I in the text as follows: "The results of this experiment show a marked difference between the two groups. In the non-oestrinized control mice 50 per cent. of the males and 56 per cent. of the females survived the first month, whereas in the oestrinized mice the survivals amounted to 79 per cent. in the males and 85 per cent. in the females." Then follows a sentence: "There is a difference between the two sexes in so far as the females showed a better survival than the males in both groups." This statement was made because we believed that, on account of the sex difference in the actual figures for the survival, objections might be raised to a comparison between the percentage survival of the combined males and females of the control group, in which the females were more numerous, and that of the combined males and females of the oestrinized group, in which the males were more numerous. For this reason the figures for the percentage survival in the column headed "both sexes" were left out of our Table I. No further reference is made to this sex difference in the rest of our paper, and in the summary the experiment is referred to only as showing that "oestrinization makes mice resistant to adrenalectomy as judged by their survival."

In the *British Medical Journal* of July 15 (p. 110) Drs. L. J. A. Loewenthal and W. A. Wilson published a paper entitled "Problems of Chance in Medicine and Research," in which they use the figures of our Table I as an example of chance. They isolate the sentence concerning the sex difference from its context; they rearrange the figures of our table, in a way which suits their argument, into an entirely different table; and they give to this new table a heading, "Adrenalectomy in Mice: Sex Incidence of Mortality with and without Oestrinization," which does not appear in our paper. In this way they leave it to be understood by the reader that the sex incidence formed an important part of our investigation and of our conclusions. By adding together the males of the control group and of the test group, and contrasting the result with the females of these two groups, they arrive at an arrangement of figures showing that of twenty-seven males eight died after adrenalectomy, and of twenty-nine females nine died. It requires no knowledge of statistics to see that these figures are not significant.

When our figures are contrasted in a rational manner—that is, in a manner showing a difference between the control group and the test group—and when in order to have the advantage of large figures sex differences are ignored, which according to Loewenthal and Wilson is permissible in our experiments, one arrives at the following table:

Adrenalectomy in Mice: Effect of Oestrinization on Mortality for Both Sexes Combined

	No. in Series	Deaths
Control group: Adrenalectomy alone	24	11
Test group: Adrenalectomy after oestrinization	32	6

If our reading of Loewenthal and Wilson's statistical table of differences is correct, the difference in the mortality lies just on the borderline "arbitrarily made between chance differences and significant differences."

We are all indebted to the statisticians for help in distinguishing chance from significant differences, but it is not permissible for statisticians or anybody else to alter the issue or rearrange figures unfairly.—We are, etc.,

W. CRAMER.
E. S. HORNING.

Imperial Cancer Research Fund,
July 21.

Vaccine Therapy

SIR,—In his address on recent advances in vaccine therapy Professor Alexander Fleming (*Journal*, July 15, p. 99) claims that there is a good case for the use of pneumococcal vaccines in pneumonia in man in conjunction with sulphapyridine. The experiments which he records are hardly relevant to this question, as the vaccines were given six days before the infecting dose, and deal therefore with prophylaxis rather than treatment. Surely the animal experiment most closely related to the problem of treating cases of pneumonia would be one devised to determine the effect of giving the vaccine and sulphapyridine at a suitable interval after the infecting dose. Has Professor Fleming done this, and if so will he publish the results?—I am, etc.,

C. J. YOUNG.

Bradford, July 16.

Action of Sulphanilamide

SIR,—I appreciate the interest underlying the very pertinent critical analysis of the anti-catalase theory of sulphanilamide action appearing in the annotation in the *Journal* of June 17 (p. 1237).

The theory was, indeed, presented in a report[1] to which reference is made only as a suggestion or "idea" upon which to base further work. The writer had been interested for a number of years in the enzyme systems of the pathogenic bacteria, realizing that in the divergencies of those enzyme systems from the enzyme systems of the invaded body[2] lay the major hope of a successful chemotherapy. The work of M'Leod, Callow, Avery, Burnet, and Tod had paved the way for an appreciation of the significance of catalase as a determinant of capacity for growth and virulence. No way, however, seemed clear to reach into and strike at the catalase within, and immediately available to, invading pathogens, without at the same time working intolerable injury upon the catalase and haemoglobin of the blood and tissue. The most effective anti-catalases known were substances like hydroxylamine, too reactive with blood and tissue to be of therapeutic value.

During the studies on sulphanilamide reported in the paper which you cite it became apparent that the drug did not begin to act upon cultures of the Type I pneumococcus in rabbit blood directly. Nor did it begin to act at first weakly and then more and more strongly, as would be expected if it were being progressively converted into a directly acting intermediate. It began to produce its characteristic growth-retarding effect only after the lapse of a period of induction which gave opportunity for the development of a growth momentum sufficient to permit accumulation of growth products. The situation looked very much like the result of a relatively quickly developed catalase inhibition followed by a slower accumulation of peroxide to a growth-checking level. Could it be possible that the added sulphanilamide was acting as a reservoir from which the pneumococci were elaborating anti-catalase within the immediate vicinity of their growth and as a consequence of their own peculiar oxidation processes? Such a development could not help but take place *if* sulphanilamide tended to yield anti-catalase on subjection to low-intensity oxidation. The possibility was brought to immediate experimental test. Solutions of sulphanilamide were exposed to the low-intensity oxidation elicited by ultra-violet light. Anti-catalase was, indeed, found to be produced. The finding not only supplied the key to the curious lag phenomena identifying sulphanilamide action but opened a door which flooded with co-ordinating light the whole field of accumulating knowledge about sulphanilamide. Small wonder that the writer felt justified in calling its significance to general attention.

Pressure from other investigations made it impossible to continue work with sulphanilamide after completion of the report which you cite. All credit for raising the suggested hypothesis from the status of an "idea" to the status of a full-fledged theory must go to Dr. R. R. Mellon, who, with Drs. Main and Shinn,[3] has pushed the presumptions of the hypothesis to experimental test. The latter workers have found that when growth retardation is produced in cultures of the Type I pneumococcus containing sulphanilamide it is preceded by a rise in peroxide content per unit of growth supported. No growth retardation could be obtained when peroxide cumulation was prevented through diminution of the tension of oxygen available to the growth medium. Fox, German, and Janeway,[4] and also Warren, Street, and Stokinger,[5] have observed an elevation of the potential imposed on an inserted platinum electrode in cultures of virulent haemolytic streptococcus containing sulphanilamide, and a loss of that imposed potential following additions of peroxide-destroying catalase and cysteine. Colin MacLeod[6] has reported a falling off in ability to produce peroxide in cultures of pneumococcus that have become sulphapyridine-fast. His evidence indicates that sulphapyridine (M & B 693) may hit some part of the dehydrogenase system rather than, or in addition to, catalase. The possibility brought out by Lockwood of an action against protease must certainly be considered, if not as a primary effect then as a secondary result of peroxide cumulation. The findings of Fuller and Maxted,[7] to which you call attention, are being subjected to experimental study, and cannot be commented on until a later time.

Few of the drugs in common use are employed with full knowledge as to mechanism of action. No more than an approximately satisfactory hypothesis as to the nature of sulphanilamide action can be hoped for at this early time. When a completely satisfactory hypothesis has finally been evolved it seems more than possible that it may point the way to an anti-enzymatic approach to the control of infection.—I am, etc.,

ARTHUR LOCKE.

The Western Pennsylvania Hospital
Institute of Pathology,
Pittsburgh, U.S.A.

[1] *J. Immunol.*, 1939, **36**, 183.
[2] *J. infect. Dis.*, 1930, **46**, 393; 1931, **48**, 419; 1934, **54**, 51.
[3] *Proc. Soc. exp. Biol.*, N.Y., 1938, **39**, 272, 591; 1939, **40**, 640.
[4] Ibid., 1939, **40**, 184.
[5] Ibid., 208.
[6] Ibid., 1939, **41**, 215.
[7] *Brit. J. exp. Path.*, 1939, **20**, 177.

Tracheitis

SIR,—Apart from the operation of tracheotomy, but scant attention is paid to the pathology of the trachea. "Tracheitis" is frequently mentioned as the cause of a chronic and annoying cough which the usual remedies have failed to clear up and which apparently has but little relation to the bronchi or to the lungs. American writers have described both an acute and a chronic infection of the trachea—an "infective laryngo-tracheitis." The association of the term "infective" in this title is befitting and appropriate, "because the course of invasion of acute infection of the trachea is normally from the upper respiratory foci downward." The upper naso-pharynx and post-nasal spaces harbour septic foci, and yield active cultures of more or less virulent organisms, which, with congestive obstruction to intranasal drainage and ventilation, may readily become important factors in the causation of, and contributing agents to, the tracheitis and its subsequent "unexplainable cough." Like acute laryngitis, acute tracheitis is secondary to invasion from infective foci in the nose and throat above.

The outstanding feature in infective laryngo-tracheitis is the cough. It is characteristic. The cough is the earliest symptom and is hard, dry, irritating, and spasmodic. There is scanty or little expectoration as the result of it. In the acute stage the cough is usually severe with strangling attacks, and it is always paroxysmal. There is also with the cough more or less hoarseness and a feeling of soreness on pressure just above and behind the sternum. The initial coryza may still persist and the patient complain of "cold in the head." The strangling paroxysms resemble pertussis, but the expiratory explosions are not followed by the inspiratory "whoop" of pertussis.

The sputum in these cases of tracheitis is also very typical. It is scanty and very tenacious, with small globular masses, grey or opalescent in colour, with soot-like particles, and distinct from any other secretion which may have been coughed up with it. Chevalier Jackson has described this type of tracheal sputum with the soot-like deposits in it as the "Moss-agate tracheal sputum." In many cases of tracheitis I have observed these globular "sooty" masses, but chiefly in the subacute or chronic stages. This sticky and scanty sputum no doubt incites the cough, and a patient will often have a bout of paroxysmal coughing until these irritating "black-Jacks," as I term them, can be dislodged and expelled, when almost dramatic relief is experienced by the patient.

The tracheal participation in the respiratory forms of influenza, in pertussis, in diphtheria, in sinusitis, and even as a sequel of the common cold, should not be overlooked, as Chevalier Jackson points out. He states that "most of the cough is tracheal in origin in most cases and very often the lungs will be found uninvolved."

As to treatment, the most important thing in the acute stage is absolute rest in bed, with free elimination by bowels and kidneys. All irritating or astringent applications should be avoided, and silver nitrate and silver preparations strongly contraindicated. I have known intense dyspnoea to supervene after the inhalation of a silver preparation. In public singers and speakers the use of the voice should be forbidden. Alkalinization of the tracheal secretions, by the internal administration of sodium bicarbonate, in moderate doses every three hours, has been warmly advocated by American physicians, and I can testify to the value of this simple remedy in controlling the strangling cough. Inhalations (hot, steam) of nebulized vapours of benzoin, "gomenol," pine, chloretone, and other non-irritating medicaments are all that are needed for local medication. The usual cough mixtures often fail to cure the cough, and the most useful is the elixir of diamorphine and terpin hydrate (P. D. and Co.); and for the very persistent cough the elixir diamorphini et terpini with apomorphine (B.P.C.) in drachm doses. In the subacute and chronic cases, where the patient is more or less free from attacks during the day, and the paroxysms occur chiefly at night when the patient is warm in bed, 30 per cent. guaiacol in glycerin freely applied to the suprasternal notch and well rubbed in will often give a comfortable night. Lastly and chiefly, the nasal and pharyngeal cavities must be constantly treated and rhinopharyngeal drainage and intranasal ventilation established.—I am, etc.,

London, S.W., July 14. BURNETT HAM.

Frank-breech Presentations

SIR,—The article and record-breaking statistics published in the *Journal* of July 15 (p. 113) by Dr. V. Mary Crosse on the management of the frank-breech presentation make sad reading. I wonder how many general practitioners or experienced anaesthetists will agree with this: "The uterine contraction is at once aided by fundal pressure until the head leaves the uterus and enters the pelvic cavity; then the patient is rapidly anaesthetized with chloroform, so as to enable the head to be pushed firmly but slowly through the pelvis by suprapubic pressure. . . . A medical officer delivers the child and conducts the labour generally. Two senior midwives assist in the delivery—one to perform fundal and suprapubic pressure, the other to give the chloroform." Surely there is no surer method of piling up a list of maternal deaths than rapid anaesthesia by a nurse with a bottle of chloroform? It is to be hoped that no budding obstetrician will attempt a new record of breech deliveries under these conditions.—I am, etc.,

Blackpool, July 16. J. MCAULEY.

Forgotten Intravaginal Pads

SIR,—I have read with interest Dr. Victor Russell's letter in your issue of July 15 (p. 143) on this subject—the more so because he stresses a point which I have found to be the case in several instances—namely, that women can wear these internal tampons with such a degree of comfort as compared with ordinary external pads that they are apt to forget (temporarily at least) about their presence in the vagina. I am not quite clear, however, from his last sentence whether he holds the view that we should advise patients arbitrarily against the use of these tampons or whether he feels just that they should be cautioned strongly against leaving the pad in the vagina for any longer period than the specified time. My own view is that we have to recognize that women *will* use these internal pads when they find by trial that they are more comfortable to wear, and that accordingly it is better simply to give the patient the benefit of one's experience of the results of their delayed removal.—I am, etc.,

London, W.1, July 22. W. G. BURNS.

The "Doctors' Cookery Book"

SIR,—In the *Journal* of July 15 (p. 140) Mrs. Violet G. Plimmer makes some comment on the *Doctors' Cookery Book* regarding the vitamin supply. The medical profession, in order to keep *au courant* with advancing medical science, has long been in need of practical help on normal nutrition, and this treatise, approved by the British Medical Association, is a good beginning. The

usual advice about diet—"Eat more," or "Eat less," or "Eat what you fancy"—has been too empirical to give nutrition its proper place as a therapeutic agent.

In setting about to make use of the *Doctors' Cookery Book* as a guide in nutrition, I found the menus were the same as would have been in use for decades. Considering the flood-lighting science has given the newer knowledge of nutrition, we need menus that will enable us to use this knowledge in a practical way.

My principal difficulties were:

1. There are no breakfast menus. Breakfast is an important meal, and needs as careful planning as dinner and supper.

2. The protein ration is high. The League of Nations has adopted 70 grammes (1 gramme per kilo of body weight) per day for a person weighing 70 kilos (11 st.) as sufficient protein. Some consider 35 to 40 grammes per day as safer. We must remember there is protein in nearly everything we eat, and if we are going to eat enough of meat, fish, fowl, eggs, or cheese to equal our normal allowance of this food element, we can easily exceed our normal requirements. There is a belief, although it is a false one, that in order to have strength and energy one must eat heartily of protein. The public are so accustomed to eat according to tradition and custom that it is difficult for them to change for the better.

3. There is no instruction about taking liquids. The body requires liquid food as well as solid, and it would be most helpful to have this important subject considered also.

4. It would be most helpful to have guidance on the balancing of meals. What should be the ratio between those foods that leave an acid residue and those leaving an alkaline residue? Some advocate 1:3 or 1:4—that is, one helping of acid-ash food to three helpings of alkaline-ash food. Since the body is alkaline it is necessary to maintain this alkalinity, which is our barrier against disease. It would seem that such a method would be a very good one, since it would prevent too high protein and provide a liberal supply of mineral salts and also of vitamins. It would constitute a sort of all-in food policy, and would meet the objection raised by Mrs. Plimmer.

Those who prepared the *Doctors' Cookery Book* deserve great credit for selecting the most nourishing foods the labouring man could afford, but if his health has not benefited, has his purse been spared? Health is the greatest asset.—I am, etc.,

London, S.W.19, July 19. L. ELWELL-JOHNSTON.

"Medical Testament" on Nutrition

SIR,—In the *Journal* of July 15 Messrs. Remington Wilson and James Gibson raise a very important matter—namely, what steps can be taken to overcome the danger of disease when human and other wastes are converted into humus. They then refer to a case in Durban (where an outbreak of amoebic dysentery was thought to have resulted from Indians treating their vegetable farms with human excreta), and go on to suggest that unless adequate precautions are taken such examples as that quoted will be multiplied alarmingly.

The possibility of spreading disease in crops, animals, and mankind by means of the Indore process was fully realized and guarded against from the moment this method was devised and put into practice all over the world. The result has been that no case of disease in crops, animals, or man has occurred where the various wastes are properly dealt with by this process. At several centres the Indore method has been subjected to a very severe test. Every kind of diseased plant material has been passed through the compost heap, and the resulting humus has been used for growing the same crop on the same land. The result has been healthy plants free from disease. The various pests associated with these diseases are attacked by the fungi and bacteria of the compost heap just like any other vegetable or animal waste, built up into new microbial tissue, and finally converted into humus. Organisms like that connected with amoebic dysentery will suffer the same fate. It must be remembered that the temperature of a moist compost heap is maintained around 150° F. for a long period, and that the changes going on are intense oxidation processes—not putrefactive. Everything which will decay (including pathogens) is automatically used for the synthesis of a new substance—humus.

Various simple and safe methods of composting human excreta, which have been in operation since 1933, are described in a paper read to Section G of the Health Congress of the Royal Sanitary Institute at Portsmouth in July, 1938. A large number of reprints of this paper have been distributed; work is in progress all over the world at many new centres; a number of municipalities and military cantonments have carried out the process successfully for some years—and no cases of disease have been brought to my notice.—I am, etc.,

July 18. ALBERT HOWARD.

SIR,—Messrs. Remington Wilson and James Gibson (July 15, p. 142) state that they heard from Durban that an outbreak of amoebic dysentery was thought to have resulted from the Indians treating their vegetables with human excreta, and asked what protection against such eventualities is afforded by the Chinese Indore processing of waste products. Let me, as an answer, describe an example of Chinese processing from Professor F. H. King's *Farmers of Forty Centuries*.

"The compost pit in front of where we sat was two-thirds filled. In it had been placed all the manure and waste of the household and street, all stubble and waste roughage from the field, all ashes not to be applied directly, and some of the soil stacked in the street. Sufficient water was added at intervals to keep the contents completely saturated and nearly submerged, the object being to control the fermentation taking place." After some months the product is removed in waterproof baskets "to the floor of the court, to the yard . . . or to the street, where it is spread to dry, to be mixed with fresh soil, more ashes, and repeatedly turned and stirred to bring about complete aeration and to hasten the process of nitrification. During all these treatments, whether in the compost pit or on the nitrification floor, the fermenting organic matter in contact with the soil is converting plant food elements into soluble plant food substances in the form of potassium, calcium, and magnesium nitrates and soluble phosphates of one or another form, perhaps of the same bases and possibly others of the organic type." Finally it "becomes a rich complete fertilizer," is allowed to dry, is pulverized, and spread in calculated quantities upon the fields.

In this prolonged fermentation heat is engendered in the compost heap. According to Dr. C. R. Harler, who is the officer in charge of Messrs. James Finlay and Co.'s estates in Southern India, "after twenty-one days the temperature should be 140° to 150°, and if it does not go above 130° there is something wrong. After that it falls until, when you have got the stuff heaped up outside the pit after sixty days, the temperature should be about 100° to 110°." In the Indore process the temperature rises to 130° at the end of five days. These temperatures may be put alongside of those for the pasteurization of milk, but the duration is incomparably longer. For the first month the fungi are in control, after which non-pathogenic

bacteria of different types successively take an increasing share in the manufacture of humus.

As regards the ova of helminths—a very important point in India in view of the prevalence of ankylostomiasis—Lieutenant-Colonel Tyrrell, Inspector-General of Hospitals and Director of Public Health, Holkar State (Indore), in 1933 reported: "The very high temperature (which is generated in a short time) leads to the destruction of insect life and also renders the compost unsuitable for fly-breeding. The temperature is so great and remains high for such a long time that it seems probable that the ova of helminths are destroyed, but it has not been possible, so far, to carry out tests in this connexion." Unless Messrs. Remington and Gibson can state that the Indians at Durban used a thorough method of composting comparable to the habit of the Chinese, the basis of their question may be considered as one not relevant to the Indore method. The question asked with relevance to the Indore method must, moreover, be accompanied by the knowledge that the healthier vegetation produced by that method turns dangerous into harmless parasites.—I am, etc.,

Caversham, July 22. G. T. WRENCH, M.D.

Mustard Gas: Need for Further Research

SIR,—The most urgent need in gas defence is for a cheap and safe non-aqueous solution which will destroy the oily mustard gas liquid. To understand this need, take a dry brick and pour on to it a dessertspoonful of eucalyptus oil. Now wash the brick with chloride of lime paste and/or soap and water. When dry it will still smell strongly of eucalyptus. If the oil had been mustard gas instead of eucalyptus the brick would be highly dangerous so long as it continued to have any smell. The fact is that one cannot easily remove a grease spot with a water solution: what is needed is a solution in alcohol, acetone, petrol, or some such solvent.

Some months ago Dr. Raper of King's College, Newcastle-upon-Tyne, read a paper on the chemical detection of war gases, and was good enough to lend me his notes. These mentioned the reaction between mustard gas and sodium sulphide in aqueous solution. I asked him whether sodium sulphide was soluble in alcohol, and he replied: "No, but ammonium sulphide is." And the question immediately arose whether ammonium sulphide in alcoholic solution would act in a way analogous to sodium sulphide in water solution.

With some difficulty we managed to get hold of an impure specimen of mustard gas for the purpose of an experiment, and I proposed to use the standard blister test, used by myself and many others during the late war. The procedure is as follows: Put a *small* drop of the liquid on a little square of flannel, and bind this outside two layers of flannel over the skin for twenty minutes. We used on one arm a drop of a 5 per cent. solution of our impure gas in alcohol as a control, against a similar quantity of a 5 per cent. solution in alcohol containing ammonium sulphide on the other. The experiment was unsuccessful, both arms being equally affected. But the interesting point was the astonishing increase in my personal susceptibility compared with twenty-one years ago. Instead of a small blister on each arm there appeared, after the usual delay period, blisters of an inch and a quarter square. In the old days I took no precautions about the fluid out of the blisters and was unaffected by it. Now extensive further blistering and irritation was caused by neglect to protect the surrounding skin and hands from contamination with the fluid. At the time of writing, six days after exposure, the primary blisters are beginning to dry up and the secondary irritation due to the blister fluid is subsiding. But the trouble and inconvenience caused by a quantity of mustard gas equal in all to a good-sized pin-head have increased my already great respect for this important substance, and I am horrified at the difficulties that might arise in poor districts, where people have neither the knowledge nor the facilities to prevent secondary infection.

It is unwise to draw conclusions from a single experiment, but it seems probable that increased susceptibility is a characteristic of increasing age. It may be mentioned in passing that we worked with the mustard gas in an ordinary draught cupboard, without wearing respirators, and, as might be expected, suffered no ill effects. All contaminated apparatus, bandages, etc., were put into a trough containing chloride of lime and water.

We hope to make some further experiments shortly, and indeed much more research work is required. It is suggested that the Home Office should send to each of the universities a pure specimen of mustard gas, with a memorandum setting out the present state of our knowledge, and a request for further research into its chemical and biological properties. It is easy to suggest innumerable experiments that should be tried, but one line of attack may be specially recommended. The most striking property of mustard gas is its action on the skin. This is a specific property arising from its chemical constitution, because other substances of similar or analogous constitution are either harmless or much less effective. It therefore seems probable that a biochemical investigation into the reactions which occur when mustard gas is absorbed into the skin would lead to the discovery of the constituent with which it specifically combines. If this constituent could be isolated and synthesized it might be used as an ointment to protect the skin, as well as for decontamination. For statistical purposes many skin tests are needed, and it is suggested that the members of each class at the civilian gas schools should be asked to submit themselves to at least one test. The majority would probably volunteer, and much valuable data could be obtained. Moreover, it would enable those who are to lecture on gas defence to the general public to speak from actual experience instead of mere hearsay.—I am, etc.,

H. A. SISSON,
Formerly D.A.D., Gas Service.

Newcastle-upon-Tyne, July 18.

Bee-sting Anaphylaxis?

SIR,—I have only just noticed the account given by "Apiarist" in the *Journal* of June 24 (p. 1306), and hasten to add an instance of a very similar occurrence. In 1927 my wife, who had kept bees for two years and had been stung on several occasions without harmful result, was working at a hive with a gauze veil over her head and gloves on her hands. Suddenly she was stung on the neck just below the jaw by a bee which had got inside the gauze and was evidently in a condition of alarm. I was close to her but not engaged in working with the bees. I heard her cry out, and, seeing that she was in distress, went to her assistance. She became almost unconscious at once, but records that she felt a marked tingling of feet and hands. She was so ill that I had to carry her into the house, and, assisted by my daughter, to do what I could to bring her round. She soon developed weals of urticaria and her breathing was very bad, of a Cheyne-Stokes type. I thought her about to die, as she was by this time quite unconscious and her pulse was scarcely perceptible. There was no adrenaline available, but I happened to have a capsule of pituitrin in the house and gave her this. I cannot explain why, but she rapidly returned to consciousness and her breathing stabilized and lost its peculiar characters. She was quite normal within two or three hours of the attack;

whether the injection had anything to do with her recovery I cannot say. She gave up bee-keeping by my advice. I have no doubt but that she suffered an "anaphylactic" shock, and that this was due to the stinging about the neck, near the brain, possibly with the penetration of a small vessel by the sting. I was stung about eleven times while rescuing her, without ill effects.—I am, etc.,

Newcastle Emlyn, Cards., July 20. S. LYLE CUMMINS.

Relative Value of Hearing Aids

SIR,—In his letter on the relative value of hearing aids (*Journal*, July 15, p. 144), Dr. C. H. C. Dalton refers to that degree of deafness when most social and business activities are greatly handicapped. He says the sufferer is regarded as a nuisance by all but the more kindly disposed among his friends, and it is embarrassing to find that any casual remarks have to be given in a clear, ringing voice that can be heard by everyone in the room. It seems to me that such embarrassment can be easily avoided by the very deaf if they insist upon their friends writing down anything that they wish them to know. This simple and most efficient method of helping the very deaf is not used so freely as it should be. Indeed, it is surprising that it is rarely mentioned in articles and books written by the medical profession or by institutes for the deaf. All other methods, including lip-reading, have their limitations. The ideal, of course, would be a portable apparatus which turned up the printed word on reception of the sound.—I am, etc.,

London, N.W.3, July 20. J. ARGYLL CAMPBELL.

"Meta Fuel" Poisoning

SIR,—As another practitioner who has recently seen a fatal case of "meta fuel" poisoning, I write to add to the opinion that this product should be scheduled as a poison without more delay. In my case, a child of 3, there was a fatal result within twenty-four hours in spite of prompt and energetic treatment at my surgery and the local hospital. It appears to be a rapidly absorbed and extremely toxic substance.—I am, etc.,

Southbourne, July 22. T. MARSHALL BELL.

Insulin Syringes

SIR,—Dr. S. Levy Simpson's letter (*Journal*, July 15, p. 142) suggesting a revision in the marking of insulin syringes raises a matter which has given us much thought in the diabetic clinic of this hospital. I too have found that patients, nurses, and even physicians often make errors in the measurement of different concentrations of insulin, even after every care in giving instructions. I think the suggestion of a 1 c.cm. syringe graduated in twenty divisions is good, but in addition to numbering the marks 1 to 20 there should be "1 c.cm." engraved opposite the "20" mark. This would enable anyone (such as a nurse or physician) who had occasion to use the syringe but who did not know the meaning of the divisions to measure a stated dose. Minims certainly tend to confusion, and we should suffer no loss if they disappeared entirely. Since, however, the difficulty arises primarily through there being different concentrations of insulin in use, it would be more effective to stop the manufacture of insulin of 20 units per c.cm. With insulin of 40 units per c.cm. even 2 units can be measured without difficulty in a 1 c.cm. syringe, and this would be represented by one division on the scale suggested by Dr. Lawrence. Even in the case of young children there need, therefore, be no difficulty in measuring the dose correctly with insulin of 40 units per c.cm. Thus there seems little justification for retaining the 20 units per c.cm. strength except that to abandon it would make most existing insulin syringes obsolete. For the much smaller number of patients to whom it is necessary to give insulin of 80 units per c.cm. the syringe marked as suggested would go far to minimize difficulty.—I am, etc.,

Victoria Infirmary, Glasgow, July 19. JAS. C. EATON.

Fracture complicating Cardiazol Shock Therapy

SIR,—Dr. Rankine Good (July 22, p. 170) observed a patient during the tonic phase of convulsions dislocate her lower jaw, and subsequently her shoulder, and fracture her humerus. During the last two years I have treated three cases of fractures caused by convulsive therapy for schizophrenia. All three were "intracapsular" fractures of the femoral neck. In two of the patients the fractures were bilateral and in one unilateral. I am not qualified to comment on the treatment of schizophrenia, but from the point of view of the fractures it is interesting to note that such "intracapsular" fractures were caused by pure muscular violence. Such evidence confirms the view held by the majority of surgeons that such fractures precede the subsequent fall, and are in fact not caused by the fall.—I am, etc.,

Richmond, July 21. WILLIAM GISSANE.

Haemophilia in Absence of Family History

SIR,—While I cannot claim personally to have come across a case similar to that described by Dr. Genevieve Rewcastle (*Journal*, July 22, p. 198) there is no difficulty in providing her with a "reasonable explanation." Transmissible variations are caused by mutations. By "mutation" is meant an apparently spontaneous alteration in a gene of such a nature that the function for which the gene is responsible develops abnormally. In Dr. Rewcastle's case the mutation must have occurred in the patient's mother. The laws of chance will then provide that half her children will possess the defective gene but that only half her sons will show the signs of the disease. A similar mutation presumably occurred in the case of Queen Victoria. I think Professor Haldane has stated that he could find no evidence of haemophilia in Queen Victoria's ancestors. There is no doubt that she distributed the faulty gene to a good many of her descendants.—I am, etc.,

London, W.1, July 24. MAURICE E. SHAW.

SIR,—With reference to Dr. Genevieve Rewcastle's letter, the occurrence of haemophilia with no history of any sufferers in previous generations cannot be a rare event. Haldane[1] has shown that, owing to the low reproductive rate of affected males, the average life of a haemophilia gene, once it has arisen by mutation, is only about three generations. The loss of genes is balanced by fresh mutations, so an appreciable proportion of haemophiliacs owe their condition to a recent mutation, and will be the first to be affected in their family group. The reason why so few published pedigrees reveal this phenomenon is the inevitable tendency for family groups containing many affected persons to be selected for recording rather than those with few sufferers, or only a single one.

Actually, however, Dr. Rewcastle's family is not exceptional, and the history given is compatible with the

[1] Haldane, J. B. S. (1935). *J. of Genetics*, **31**, 317.

transmission of the gene from a remote ancestor. On this assumption, the odds against all the related males she mentions happening to be normal are only about four to one, so there is no evidence of anything other than the operation of the laws of chance.

There is no evidence, therefore, that a recent mutation has taken place, but in any event the practical consequences are the same. The mother carries the gene, and any further sons born to her have a one in two chance of being haemophiliacs; the daughter, and any further daughters, have a one in two chance of being carriers.—I am, etc.,

Bristol, July 22. J. A. FRASER ROBERTS.

Medical Psychotherapy

SIR,—The correspondence in the *Journal* of July 15 (p. 139) on the question of medical versus lay psychotherapy is both interesting and enlightening. Apparently, while it is desirable that the scientific level of medical psychotherapy should be at least as high as that of any other medical specialty, the psychotherapist himself may not look forward to the enjoyment of an income necessary for the upkeep of a consultant's station in life. Might not the problem be solved by encouraging middle-aged doctors who have already made a financial competency, either as consultants or as general practitioners, to take up psychotherapy? It was not for nothing that the ancients elevated their wise elderly men to positions of honour in the community. Psychotherapists should possess what are usually described as "suitable personality qualifications." Are not these the very qualities often possessed by doctors after long practice, together with a store of wisdom and a knowledge of human nature unknown to the young graduate who proposes to specialize as soon as possible in psychotherapy? What more suitable occupation could there be for the consulting physician who must perforce retire from his hospital at the age of 60? Or for the successful family practitioner of 55 who is beginning to feel the wear and tear of active work? The suitable person might delegate some of his work to a younger man, take time off for training and analysis, and eventually turn completely over to psychotherapeutic work. To make this worth while the retiring age for specialists in this branch of medicine might well be raised to 70. We live longer and more healthily nowadays, and psychotherapy is a more restful occupation than many other forms of medical practice. It is surely, also, the one specialty where the ripe wisdom of experience is of the greatest value.—I am, etc.,

London, W.1, July 17. ETHEL DUKES.

Universities and Colleges

UNIVERSITY OF CAMBRIDGE

The following candidates have been approved at the examinations indicated:

DIPLOMA IN MEDICAL RADIOLOGY AND ELECTROLOGY.—*Part I:* R. D. Howat, S. R. Reynolds. *Part II:* H. N. Bhatt, J. P. Bostock, F. Bush, F. M. Crawshaw, W. G. S. Harden, T. M. Hennebry, C. W. Horncastle, K. Abdel-Khalik Kassem, C. F. MacGuire, S. A. Maddocks, R. T. Marshall, G. F. Rees-Jones, Z. C. Rutherford, E. Samuel, Ida B. S. Scudder, W. E. McL. Topping.

UNIVERSITY OF LONDON

At a meeting of the Senate held on July 19, W. G. Barnard, F.R.C.P., was appointed to the University Chair of Pathology tenable at St. Thomas's Hospital Medical School.

The title of Reader in Medicine was conferred upon E. F. Scowen, M.D.

R. M. Calder, M.B., Ch.B., has been reappointed to the Graham Scholarship in Pathology for a further period of one year.

The following candidates have been approved at the examination indicated:

ACADEMIC POSTGRADUATE DIPLOMA IN PSYCHOLOGY.—S. C. Amin, Florence E. Beatty, Sybil M. Crane, N. H. Dalal, Vera D. Deutz, Mildred E. Evans, A. H. Fife, Ruth Foster, Sylvia C. Harnett, D. K. Hingorani, Marjorie H. Kent, L. G. Mirchandani, Norah C. Morrison, E. S. Pahlson, Helen R. Reid, Ruth Solow, Kathleen M. Thomas, Grace E. V. Vilfranc.

M.S.—*Branch I (Surgery):* F. R. Kilpatrick, W. R. Merrington, J. E. Spalding. *Branch III (Ophthalmology):* C. J. F. Blumenthal.

UNIVERSITY COLLEGE HOSPITAL MEDICAL SCHOOL

The following scholarships, exhibitions, and prizes have been awarded at University College Hospital Medical School:

Goldsmid Entrance Scholarships, N. B. Myant, R. D. M. Innes-Ker Harkness. *Goldsmid Entrance Exhibition*, Gwendoline R. Briggs. *Filliter Entrance Scholarship in Pathology*, Anne Bolton. *Atchison Scholarship*, J. D. N. Nabarro. *Atkinson Morley Scholarship*, W. S. Lewin. *Magrath Scholarship*, W. S. Lewin, Miss E. G. Seaton, R. D. Kennedy. *Filliter Exhibition*, R. E. O. Williams. *Liston Gold Medal*, A. G. Spencer. *Erichsen Prize*, C. V. Gledhill. *Alexander Bruce Gold Medal*, A. G. Spencer. *Fellowes Gold Medal*, M. Steel. *Fellowes Silver Medal*, E. Petrie. *Tuke Silver Medal*, A. G. Spencer. *Tuke Bronze Medal*, R. E. O. Williams. *Junior Clinical Surgery Prizes*, R. B. N. Wilsdon, N. Hext. *Suckling Prize in Obstetrics and Gynaecology*, J. D. N. Nabarro. *F. T. Roberts Prize in Obstetrics and Gynaecology*, R. D. Kennedy. *Ferriere Scholarship*, Miss A. E. Walker. *Postgraduate Award: Bilton Pollard Fellowship*, M. L. Rosenheim, M.R.C.P.

KING'S COLLEGE HOSPITAL MEDICAL SCHOOL

The Anatomy and Physiology Scholarship was awarded to S. G. Tuffill, and the Science Scholarship to G. Grant.

UNIVERSITY OF MANCHESTER

At the last meeting of the University Council the resignation of Professor F. Wood Jones from the chair of anatomy was received and accepted with regret. Professor Wood Jones will retire from the post at the end of the Michaelmas term in the session 1939–40.

The following appointments are announced:

Dr. David Stewart as Assistant Director of the Anatomical Laboratory; Dr. T. H. B. Bedford, Dr. William Brockbank, Dr. F. R. Ferguson, Dr. P. B. Mumford, Dr. J. F. Ward, and Dr. R. Whitehead as members of the Board of the Faculty of Medicine; and Dr. T. E. Barlow and Dr. S. Mottershead as Demonstrators in Anatomy.

UNIVERSITY OF READING

At a Congregation on July 8 Dr. H. S. Le Marquand was appointed a member of the University Council.

UNIVERSITY OF SHEFFIELD

The University Council made the following appointments on July 14:

Wilson Smith, M.D., to the Chair of Bacteriology, in succession to the late Professor J. W. Edington; W. J. Lytle, F.R.C.S., as Honorary Lecturer in Surgery to Dental Students; Andrew Wilson, M.B., Ch.B., as Assistant Lecturer in Pharmacology.

UNIVERSITY OF EDINBURGH

A graduation ceremony was held in M'Ewan Hall on July 19, when the following degrees and diplomas were conferred:

M.D.— P. C. Davie, ***H. L. de Waal, I. J. Freedman, J. A. Guy, R. Hardy, F. D. Hart, *J. S. Jeffrey, J. A. M'Lauchlan, **W. M. Millar, **R. A. Miller, A. R. M. Moir, J. M'G. Rogan, Maud I. Smith, *H. Stalker.

C.M.—**C. F. W. Illingworth.

M.B., CH.B.—W. J. Abel, Catherine J. A. Aitken, I. Ap Thomas, M. W. Archdall, G. W. Baker, G. W. Balfour, Beatrice M. Bartlet, M. Beaton, T. Black, J. Borrowman, Anne E. Boyd, D. K. Bradley, G. A. R. Brown, H. M. Brown, Kathleen M. Buchanan, D. W. Burton, C. S. Campbell, I. D. Campbell, W. Carruthers, T. S. Chalmers, A. J. Clarke, J. C. Comline, L. S. Cooke, Monica de S. Craig, W. G. Cuthbertson, N. M. B. Dean, P. R. Dickson, M. Dods, Glenys M. M. Donaldson, K. J. Dunlop, F. C. Edington, A. W. B. Edmunds, I. N. J. Eggeling, J. S. Elliot,

A. F. El Shahed, Ruth A. J. Evershed, C. D. Falconer, C. W. A. Falconer, W. Falconer, Jean E. Fleming, G. M'I. Forsyth, W. H. Galloway, M. Gardiner, Elizabeth Gemmell, J. W. Gibson, W. W. A. Gibson, Agnes J. M. Gilruth, †R. H. Girdwood, C. A. Gleadhill, A. M. Glen, Patricia E. Goddard, W. W. Gordon, Sarah H. Graham, L. S. Grant, J. S. Gray, Constance F. Hardy, J. Harper, A. B. Hegarty, A. G. S. Hill, D. W. Horn, Kathleen I. Hughes, Ethel J. Kay, J. A. Key, D. J. Kirke, B. D. Kholi, G. R. Kulkarni, W. R. Lamb, N. A. Lamberty, Anne M. Lauder, T. W. Lees, W. I. Leslie, R. E. S. Lewis, Anne H. Lockie, A. M. Loughran, Jean M. M. Lyon, Catriona C. M'Callum, Betty P. M'Clements, M. P. M'Cormack, Mary B. M'Donald, R. M. MacDonald, E. C. MacFadyen, J. D. M'Gregor, A. S. M'Kenzie, L. M. Mackenzie, Margaret D. R. Mackinnon, Isobel J. M'Larty, G. MacNaughtan, P. G. M'Neil, J. O. F. Macrae, M. MacM. Macrae Elizabeth M. L. MacWatt, A. Main, S. E. O. Martin, H. S. Marwick, A. K. M. Mazhar, J. B. Menzies, Nancy S. M. Milne, J. M. Muir, V. V. Muir, D. F. Mungall, J. A. L. Naughton, W. W. Park, J. L. M. Parnell, I. D. Paterson, H. Pattinson, S. S. Pavillard, H. J. B. Pershad, W. B. Preston, N. H. L. Pringle, Margaret E. Quin, A. S. Qunta, A. R. Ralley, G. J. Ralston, G. W. Reid, J. H. Robarts, A. A. C. Ross, D. F. Ross, J. Rutherford, J. C. B. Serjeant, R. P. Seymour, D. W. Shannon, T. M. Simpson, S. A. Sinclair, K. A. Sleem, Mora F. Smeaton, A. M'E. Smith, W. L. Smith, R. Stalker, G. D. F. Steele, W. Storrar, Catherine M. Sunderland, G. B. Tait, A. W. O. Taylor, A. C. P. D. Thomson, A. M'E. Turnbull, A. J. Varga, E. von Kuenssberg, A. Walker, D. G. Walker, G. B. Walker, H. W. Whitcher, G. R. Wightman, W. C. Wightman. I. D. Willatt, D. E. Williams, T. G. Wilson, G. B. Young, W. K. Young.

B.Sc. PATHOLOGY, *First Class.*—†G. W. A. Dick, †W. Forbes.

DIPLOMA IN PUBLIC HEALTH.—G. F. Anderson, C. E. S. Bailey, E. W. Graham, Alison M. B. Hamilton, Betty C. Hamilton, M. S. Khan, R. B. Lucas, Edith M. Martin, R. M. Ross, Jasmine Taylor, R. M. White.

DIPLOMA IN TROPICAL MEDICINE AND HYGIENE.—H. L. de Waal, T. Evans, Joan F. M. E. Lamplugh.

DIPLOMA IN PSYCHIATRY.—S. I. Ballard, Kathleen B. Cobb, J. J. M. Jacobs, W. W. Laughland, J. Leckie, A. Manugian, W. M. Millar, R. M. Young.

DIPLOMA IN MEDICAL RADIOLOGY.—W. N. Brown, J. Phelan.

*** Awarded gold medal for thesis. ** Highly commended for thesis. * Commended for thesis. † Passed with honours.

The following prizes were presented.

Cameron Prize in Practical Therapeutics: Dr. Gerhard Domagk (Elberfeld), in recognition of his discoveries which initiated the treatment of diseases of bacterial origin by compounds belonging to the sulphonamide group. *Ettles Scholarship and Leslie Gold Medal, Beaney Prize in Anatomy and Surgery, Keith Memorial Prize in Systematic Surgery, Royal Victoria Hospital Tuberculosis Trust Gold Medal, and Wightman Prize in Clinical Medicine:* R. H. Girdwood. *Scottish Association for Medical Education of Women Prize and Annandale Gold Medal in Clinical Surgery:* Leonore S. Cooke. *Mouat Scholarship in the Practice of Physic and Conan Doyle Prize:* D. W. Burton. *Buchanan Scholarship in Midwifery and Gynaecology:* Betty P. M'Clements. *James Scott Scholarship in Midwifery and Gynaecology:* Leonore S. Cooke and Nancy S. M. Milne (equal). *Dorothy Gilfillan Memorial Prize and Murdoch Brown Silver Medal in Clinical Medicine:* Glenys M. M. Donaldson. *Pattison Prize in Clinical Surgery:* G. M. Wilson. *Sir Robert Jones Prize in Orthopaedic Surgery:* Constance F. Hardy. *Sir Humphry Rolleston Prize:* M. Gardiner. *Murchison Memorial Scholarship in Clinical Medicine:* A. J. M. Drennan. *M'Cosh Bursaries:* J. Innes and F. H. Robarts. *Vans Dunlop Scholarship in Public Health and Clinical Therapeutics:* I. A. G. MacQueen. *Gunning Victoria Jubilee Prize in Bacteriology:* H. L. de Waal. *Gunning Victoria Jubilee Prize in Therapeutics:* J. D. Allan. *Gunning Victoria Jubilee Prize in Child Life and Health and Thomson Memorial Medal in Child Life and Health:* R. A. Miller. *Lewis Cameron Undergraduate Prize in Bacteriology:* G. Dempster and J. Orr (equal). *Wellcome Gold Medal and Prize in the History of Medicine:* H. L. de Waal. *Wellcome Silver Medal and Prize in the History of Medicine:* Sarah H. Graham. *Maclagan Prize in Forensic Medicine:* Margaret H. Peill. *Cunningham Memorial Medal and Prize in Anatomy:* R. T. S. Louttit. *Whiteside Bruce Bursary:* B. Cruickshank.

An address was delivered to the new graduates by the Promotor, Professor C. M'Neil.

UNIVERSITY OF DUBLIN

SCHOOL OF PHYSIC, TRINITY COLLEGE

The following candidates have been approved at the examinations indicated:

M.D.—Marjorie R. E. Boyd, J. E. Gillespie, H. B. Sutton, H. B. Wright.

FINAL MEDICAL EXAMINATION.—*Part I, Materia Medica and Therapeutics, Pathology and Bacteriology:* *Maude F. P. Bigger, †G. S. Prince, †W. G. D. Caldwell, †G. B. Gibson, Kathleen M. J. Morphy, Helen S. Watson, B. W. Wyllie, J. R. Hassard, D. W. Montgomery, C. E. Williams, Ivy K. Bayne, Ethna M. MacCarthy, J. N. Greene, E. D. Khan, A. F. Crowley, A. G. Lee, Margaret F. Y. Dixon, Alicia G. Pike, H. H. Robinson, T. J. N. Bates, J. D. Dennehy, A. R. B. Jackson, J. B. Dunlop, G. F. Shaw. *Part II, M.B.:* †J. D. Whiteside, †D. Selman, †F. L. Willington, †C. B. Robinson, †G. F. N. Anderson, †Sylvia M. Hall, †Muriel Bannister, †J. K. Craig, †L. E. Morris, †C. W. Bradfield, Lucia M. E. FitzGerald, S. Fine, W. E. Bamford, J. C. G. Moore, R. G. P. Heard, M. Daly, A. H. Isaacson, G. S. Sheill, Kathleen Dowling, B. S. Good, Olive S. H. Devlin, T. N. Arthur, N. J. Hogan, T. Shier, M. Shreider, J. Freedman, A. Graham, W. F. Carpenter, D. W. McCarthy, A. C. Corbett, E. F. Keating, N. C. Brown, C. H. Rutherford, G. A. Anderson, D. L. Harbinson, Frances M. C. Wolfe, G. E. P. Kelly. *Surgery, B.Ch.:* †C. B. Robinson, †Sylvia M. Hall, †R. S. W. Baker, †F. L. Willington, P. M. Goedvolk, J. K. Craig, H. D. Chomse, J. D. Whiteside, A. C. Corbett, J. P. Gore-Grimes, E. G. Hobart, F. A. Hanna, F. deBurgh Whyte, M. H. Waters, M. Herman, W. B. Welply, W. F. Carpenter, Maureen C. Johnston, A. Graham, M. Daly, L. E. Morris, E. Cullen, H. S. Boyce, D. W. McCarthy. *Midwifery, B.A.O.:* †H. H. Balch, †J. R. Healy, W. Jones, K. T. Acton, P. C. Denham, R. W. Carey, E. G. Millar, T. H. Downes, Moira M. Mallagh, F. J. Queally, M. N. O'Riordan, Phoebina Eakins, R. M. Halahan.

DIPLOMA IN GYNAECOLOGY AND OBSTETRICS.—†R. A. Fairley, †W. F. Joynt, †H. M. Ayoub, M. Abd-El-Khalik Abed.

DIPLOMA IN PUBLIC HEALTH.—*Part I:* T. S. Agnew. *Part II:* *J. C. Gaffney, †J. G. Cunningham, S. H. Morrison.

DIPLOMA IN PSYCHOLOGICAL MEDICINE.—*Part I:* *J. N. P. Moore.

The following prizes have been awarded:

FitzPatrick Scholarship: M. O'C. Drury, M.B. *Medical Scholarships:* Anatomy and Physiology, Elizabeth D. L. Simpson; Chemistry, Physics, Botany, and Zoology, A. B. Walsh. *Dr. Henry Hutchinson Stewart Scholarship in Mental Diseases:* J. N. P. Moore, M.D. *Dr. Henry Hutchinson Stewart Medical Scholarships:* Anatomy and Physiology, F. S. Stewart; Chemistry, Physics, Botany, and Zoology, H. R. Hanna. *John Mallet Purser Medal:* Violet K. St. G. Breakey. *Daniel John Cunningham Memorial Medal and Prize:* F. S. Stewart. *De Renzy Centenary Prize:* J. C. Gaffney, M.B. *Aquilla Smith Prize:* Maude F. P. Bigger. *Walter G. Smith Prize:* Helen S. Watson. *Conolly Norman Medal in Mental Diseases:* Kathleen Dowling. *Butterworth Prize:* F. L. Willington, M.B. *Welland Prize:* H. R. Hanna.

* First-class honours. † Second-class honours.

ROYAL COLLEGE OF PHYSICIANS OF EDINBURGH

A quarterly meeting of the Royal College of Physicians of Edinburgh was held on July 18, with Dr. Alexander Goodall, the President, in the chair. Dr. B. G. T. Elmes (Nigeria) and Dr. A. G. Stevenson (Durban, South Africa) were elected Fellows.

ROYAL COLLEGE OF SURGEONS OF EDINBURGH

At a meeting of the Royal College of Surgeons of Edinburgh, held on July 21, with Mr. W. J. Stuart, President, in the chair, the following, having passed the requisite examinations, were admitted Fellows:

R. R. Mutrie, G. A. H. Adam, H. I. Baigel, A. F. M. Barron, T. J. Beresford, A. Bickford, W. C. Botha, W. S. Charlton, S. J. Cohen, D. H. Cummack, T. Das, E. W. Dorrell, G. W. Duncan, J. W. Hannay, E. S. Jamieson, Beatrice M. Joly, M. M. Kennedy, J. T. Laurenson, D. McIntosh, R. D. Macrae, K. I. Macrosson, G. B. Mair, W. A. M. Marrow, M. G. Mohamed, F. T. Moore, H. G. Page, W. M. Quin, H. R. Robertson, J. M. Robins, J. A. Shepherd, M. L. Slotover, K. J. Talbot, J. J. van Niekerk, E. P. White.

ROYAL COLLEGE OF OBSTETRICIANS AND GYNAECOLOGISTS

At the quarterly meeting of the Council, held in the College House, London, W., on July 22, with the President, Professor W. Fletcher Shaw, in the chair, the following officers were elected:

President: Professor W. Fletcher Shaw. *Vice-Presidents:* Mr. Eardley L. Holland and Professor Miles H. Phillips. *Honorary Treasurer:* Mr. J. P. Hedley. *Honorary Curator of Museum:* Mr. Aleck W. Bourne. *Honorary Librarian:* Mr. Frederick Roques. *Honorary Secretary:* Mr. G. F. Gibberd.

The following Member was admitted to the Fellowship: D. H. MacLeod.

The following were admitted to the Membership: J. Lyle Cameron, W. M. Capper, A. Charles, Alice E. Dickie, C. McT. Hopkins.

The following were elected to the Membership: R. I. Ritchie, B. H. Anderson, A. W. Andison, G. W. Blomfield, D. R. Cairns, W. D. A. Callum, D. G. W. Clyne, G. Dalley, D. S. Greig, T. N. Hart, W. Hawksworth, W. M. Lemmon, G. G. Lennon, F. R. Lord, R. Lyons, T. A. MacFarlane, D. M. W. Maxwell, S. Misra, C. V. Salisbury, Everall M. Shippam, R. de Soldenhoff, E. A. Thomas, S. L. Townsend, J. D. Watt, Ella Windeyer.

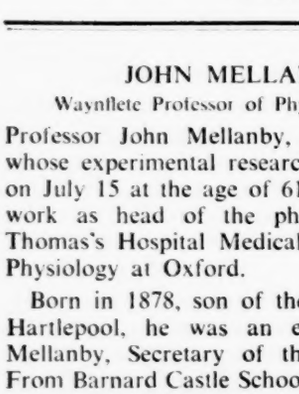
Obituary

JOHN MELLANBY, M.D., F.R.S.

Waynflete Professor of Physiology, University of Oxford

Professor John Mellanby, the distinguished physiologist whose experimental researches covered a wide field, died on July 15 at the age of 61. He had done very valuable work as head of the physiological department at St. Thomas's Hospital Medical School and of the School of Physiology at Oxford.

Born in 1878, son of the late John Mellanby of West Hartlepool, he was an elder brother of Sir Edward Mellanby, Secretary of the Medical Research Council. From Barnard Castle School he went to Emmanuel College, Cambridge, in 1896, with a scholarship, and gained first-class honours in both parts of the Natural Sciences Tripos. In 1902 he started the physiological department of the new research laboratories of Burroughs Wellcome and Co. in Battersea, and there carried out original work on the globulins. After three years in this laboratory he entered Manchester University as a medical student and, completing his clinical studies in 1906, he obtained the M.D. degree at Cambridge in 1907 without taking any intermediate qualification. His M.D. thesis gained for him the Raymond Horton-Smith Prize for the best research of the year among those taking this degree. The next two years he passed at the Physiology Laboratory, Cambridge, as George Henry Lewes Student, and it was at this time that he did his well-known work on blood coagulation, in which, by careful quantitative work, he unravelled this complicated process. Here again, as in the case of his globulin investigations, this excellent work went practically unnoticed, and it was only with the passage of time that it became more and more appreciated and its truth accepted. In 1909, at the age of 31, he was appointed head of the physiology department at St. Thomas's Hospital in succession to Professor J. B. Leathes. He remained in this post for twenty-five years, being made a professor of London University in 1920. In 1929 he was elected a Fellow of the Royal Society, and was a Councillor of this body at the time of his death. In 1936 he succeeded Sir Charles Sherrington as Waynflete Professor of Physiology at Oxford, and in this short period of three years he has impressed his personality and scientific acumen on his colleagues. He followed Sherrington in other respects, being a Cambridge man who became lecturer on physiology at St. Thomas's, and at Oxford a Fellow of Magdalen. At the Edinburgh Meeting of the British Medical Association in 1927 he was vice-president of the Section of Physiology and Biochemistry.



A correspondent writes:

Research in physiology has been the essential feature of the whole of the working life of Professor John Mellanby, F.R.S. At the age of 24 he showed his ability as an original investigator and, among other publications at this period, his contribution on the physico-chemical properties of globulins, although overshadowed at the time of publication by the late Sir William Hardy's contribution on the same subject, has become more appreciated with the passage of time, and is now regarded as a classic paper. During this short period he also published important work on blood plasma and on methods of concentrating diphtheria toxin and antitoxin.

It will probably be some years before a true assessment of the real value of his scientific output will be made. There are some investigators whose work is rated highly and whose names are established among the leaders of their subject without any latent period. This was not the case with John Mellanby. True appreciation of his high place as an investigator has grown slowly but certainly, and there is good reason to believe that even now his great capability is not rated at its true value. This was no doubt largely his own fault. He was critical and even somewhat intolerant in speech, qualities which contrasted greatly with his tolerance of action in the case of workers in physiology with whom he worked and lived. His sense of independence in thought, speech, and action, his disinclination to take on responsibilities outside his own immediate sphere, and his critical attitude towards the generally accepted views of the problems upon which he worked, tended to isolate him during many of his earlier years. Again, he did not follow the rule that usually leads to the highest distinction in science by confining himself to one main branch of physiology, though it is true that he had a number of problems of physiology to which he constantly reverted throughout his working life, but only wrote about when he had some outstanding discovery to report. He considered himself a general physiologist, and was prepared to investigate any problem that interested him. The field of investigation he covered was immense, and perusal of his numerous publications will soon bring the realization that he never embarked on any inquiry without bringing to light some new important facts. Whether the subject was blood coagulation, the mode of secretion and properties of bile and pancreatic juice, the purification and properties of secretin, prothrombin, and thrombase, the relation of the nervous system to blood sugar, the buffering power of blood proteins, the absorption of fat from the intestine, the mode of action of the bladder, the nature of enzyme action or the relation of the spleen to red blood corpuscles, his contributions to knowledge in each case were fundamental. In almost every subject which he investigated his experimental results led him to heterodox conclusions, and it often took years before his brother physiologists found his facts unassailable and his ideas correct. A typical example of this was his work on secretin, which he demonstrated was present as such in the mucous membrane of the intestine. He also showed that secretin was liberated into the blood stream by bile salts. These views were completely contrary to the generally accepted theory that the entry of acid chyme into the duodenum controlled the production of secretin from prosecretin and its liberation into the blood stream. Short of the great distinction of opening up some line of physiological discovery peculiar to himself, it is doubtful whether any other living physiologist, working so often with a lone hand, has contributed so many facts to the science.

In judging John Mellanby's contribution to science it must be remembered that, unlike many distinguished physiologists nowadays, he always had an important teaching department to control, so that his research could only be done secondarily to this duty. The need for constant lecturing on the whole of physiology was undoubtedly a reason for the wide field of his researches. Nor was his teaching done in any perfunctory way. He was a remarkably fine exponent of his subject. In his case there was never any need to urge students to attend his lectures. His clear incisive mind allowed him to analyse even the most complicated physiological process and synthesize the factors into a lucidly expressed whole. The masterly way in which he expounded such problems, often dished up with a peculiar humour and occasional acidity of expression, but otherwise free from verbiage, brought great appreciation of his lectures from students, while his delivery of reports of original work to the Physiological Society will long be remembered.

While at St. Thomas's Hospital his influence in bringing about a closer union of the clinical and scientific aspects

of medicine was very great. He was probably the first physiologist in any London medical school who was constantly invited by the clinicians to help in the choice of new members of the honorary staff. This sense of respect by physicians and surgeons of a large teaching hospital for the preclinical sciences is of recent date, and one for which Mellanby can be held largely responsible. This is one of the reasons why his death after a short tenure of the Waynflete Professorship is such a serious blow to Oxford University at the present time. The establishment of the Nuffield Chairs of Clinical Science at Oxford has brought many problems, but the most urgent is the need for close union between the clinical and preclinical schools at that university. Mellanby's wisdom, knowledge, and high scientific standing fitted him for the task of chief liaison officer; and, although he was reluctant to undertake this work, it was becoming more and more clear that he was the person who would act as harmonizing agent. Already he had accepted workers from the surgical and anaesthetic units of the Nuffield Foundation into his physiological laboratory, and the process of welding would have continued and expanded. Great demands were made by senior students and others to work under his direction at Oxford, and there can be little doubt that he would have even increased the present great reputation of the School of Physiology at Oxford had he been given the time.

John Mellanby's life was one of solid achievement. He worked intensely because his work was his great pleasure. There was, however, another side to his character only revealed to his friends. He got immense pleasure out of achievement of any kind, especially if this was associated with beauty. His knowledge of and skill in gardening were very great. Any free time in London often brought him to Christy's, where he would purchase some beautiful but inexpensive example of craftsmanship and bear it home rejoicing to show to his family and intimate friends. He bought articles because they pleased him, and then he proceeded to study the subject they represented. His knowledge of antiques thereby became great. He was, however, no showman either of his work or of his knowledge, and his vivid interest in and knowledge of life were only appreciated by those who came into close communion with him.

[The photograph reproduced is by Russell, London.]

W. A. POTTS, M.A., M.D.

We regret to announce the death at Edgbaston on July 23 of Dr. William Alexander Potts, who had long been associated with the Royal Albert Institution, Lancaster, as consulting physician, and in 1919 was appointed psychological adviser to the Birmingham justices.

Born at Rugby on May 1, 1866, the son of A. W. Potts, LL.D., afterwards headmaster of Fettes College, he was educated at Fettes, at Pembroke College, Cambridge (gaining second-class honours in the Mathematical Tripos of 1888), and, later, at the University of Edinburgh. After graduating M.B., C.M.Ed. in 1895, he held in turn the posts of resident medical officer to the York East Riding Lunatic Asylum, resident surgeon to the Edinburgh Royal Infirmary and to the Royal Maternity Hospital, and resident physician to the Royal Hospital for Sick Children. He proceeded to the M.D. of Edinburgh, with honours, in 1898, and took the English conjoint diplomas in the following year.

The next phase of Potts's career opened at Birmingham, with which his family had long association, and he practised there for twenty years. He became medical officer to the local Committee for Mental Defectives, and was an active worker in promoting the passage of the Mental Deficiency Act, 1913. He took the M.D. of Birmingham and was appointed chief medical investigator for the Royal Commission on the Care and Control of the Feeble-minded in 1906. He was consulting physician to the Great Barr Park Colony, and physician to the mental wards of the Hallam Hospital. At the Annual Meeting of the British Medical Association in Birmingham in 1911 he served as honorary secretary of the Section of Therapeutics. After the war Potts gave up all general practice to devote himself to psychological work, and in recent years he had been an honorary physician to the Tavistock Clinic. He was joint author with Dr. Shuttleworth of *Mentally Defective Children*, and wrote numerous articles on child guidance, delinquency, nervous disorders, and mental hygiene.

The medical profession in Brighton have sustained a great loss by the death on June 14, at the age of 67, of Dr. ERNEST RIVAZ HUNT. Dr. Hunt received his medical education at Cambridge and St. Mary's. He held the posts of house-surgeon, house-physician, and resident obstetric officer at that hospital and took the degrees of M.A. and M.D. at his university, and later the M.R.C.P. He was appointed to the honorary medical staff of the Royal Sussex County Hospital, first as assistant physician, later as physician, and finally as consulting physician, which post he had held for only two years since his retirement from the active staff. In addition he was honorary consulting physician to the Haywards Heath Hospital, examiner for the General Nursing Council for England and Wales, and medical referee in the Brighton area for the Ministry of Pensions. Dr. Hunt served during the great war with the North Russian Expeditionary Force, with the rank of lieutenant-colonel, and was mentioned in dispatches. Previously he had served on the staff of the Second Eastern General Hospital at Brighton. He held the office of president of the Brighton and Sussex Medico-Chirurgical Society, and at the annual meeting of the British Medical Association at Brighton in 1913 he acted as secretary for the Section of Pharmacology and Therapeutics. Dr. Rivaz Hunt had a quiet and unassuming personality. He was beloved by his colleagues, and they one and all trusted and respected him. It can be said of him that he had no enemy.

The recent death of SYDNEY BACKHOUSE HULKE, F.R.C.S., has removed a popular figure from his many friends in Thanet. He belonged to the tenth consecutive generation of the Hulke family to follow the medical profession, and the name of Hulke is intimately linked with Deal, where the family has practised since it was driven from the Low Countries by the persecution of the Duke of Alva more than two hundred years ago. His brother and his nephew, who both predeceased him, all practised together and at the same time on this part of the Kentish coast. Hulke was educated at the Middlesex Hospital, where his famous uncle, John Whitaker Hulke, was surgeon; and, like the latter, he evinced an early interest in the military aspect of surgery, and served in the Boer War. In the war of 1914–18 he worked indefatigably in three hospitals at Deal and Walmer. In the earlier period of his career he was for several years surgical registrar at Middlesex Hospital, but elected to leave London and to return to that part of England with which his family had been for so long and so closely associated. G. G.-T. writes: Hulke fulfilled one's ideal of the very best type of British practitioners, one of the finest types that our country begets. Nature had gifted him with a fine physique, courage, and sympathy, and these were used devotedly in the service of such as sought his professional aid. His temper was ever unruffled; he was never known to be discourteous or to make himself difficult to anyone. The esteem and affection of all classes were shown at the funeral at Walmer: the enormous congregation of rich and poor who came to pay a last tribute attested the depth of love of his patients for him. The Hulke tradition is still handed on. His married daughter, Muriel Brander, is a Fellow of the Royal College of Surgeons of England.

Dr. A. R. HAMILTON BLAND of Rosary Gardens, South Kensington, who died recently at the age of 85, was easily the doyen of the general practitioners in his district, for it was a good deal more than sixty years ago that he established himself there. His early years in practice were the days of large mansions, large families, and large practices—ten or fifteen years before Kipling wrote of the "carriages blocking the half of the Cromwell Road." Among his colleagues of that epoch Bland was well known and greatly respected. He was several inches over six feet in height, and made the most of them by a very upright carriage, which he retained into extreme old age until arthritis robbed him of it during the last two or three years of his life. A close-trimmed beard and unusually piercing grey eyes combined to give his spare but stalwart form an air of great distinction. At one time, early in the century, he had a nephew, Dr. Stokes, as a partner; but after the latter's early death he carried on single-handed until a few years after the end of the great war, when he took Dr. H. Rivers Pollock into his firm. After several more years Bland retired from practice (nominally, for he continued to attend a few old patients until his health gave way completely some three or four years ago). His will, recently published, allots £100 to a nurse for her care of him and of many of his patients—a kindly thought, typical of an Irishman who was genuinely warm-hearted, though a certain brusqueness of manner may have prevented some people from realizing it. Dr. Bland had been a widower for several years.

Dr. WALTER JOHN ERNELY SUMPTER died suddenly on July 5 at his home in Sheringham, where he had lived for more than fifty years. Born in 1862, he studied medicine at University College, London, took the L.S.A. in 1883, the M.R.C.S. in 1884, and the L.R.C.P. in 1891, and in 1909 obtained the M.D. degree of Durham University. His medical practice was an extensive one, and for a number of years he was medical officer of health for the Sheringham Urban District. He had also held a commission as captain in the old R.A.M.C. Volunteers. One of the original members of the Sheringham Golf Club, Dr. Sumpter was for four years its honorary secretary, and in 1905–6 captain. He joined the East Norfolk Division of the British Medical Association in 1912.

By the death of Dr. HUBERT EUGENE ALEXANDER LEMERLE on July 16 Tunbridge Wells has lost a highly respected medical practitioner. The eldest son of A. F. Lemerle, barrister-at-law, he was born in India in 1880, and graduated M.B., Ch.B. at the University of Edinburgh in 1911 after taking a degree in arts. He held a number of resident appointments in London and elsewhere, and did good service during the early part of the war. Settling in practice at Tunbridge Wells in 1928, he was later appointed medical examiner to the local anti-aircraft battery and military recruiting medical officer. The funeral at St. James's Church was attended by brother officers. Dr. Lemerle joined the British Medical Association in 1914, and was a prominent Freemason.

Dr. GEORGE WILLIAM WATSON, who died recently in a Carlisle nursing home, was a well-known member of the medical profession in West Cumberland, and practised at Distington. He was born at Battley, Yorks, in 1890, and studied medicine at Leeds University, qualifying as M.R.C.S., L.R.C.P. in 1914. His first appointment was resident obstetrical officer at the General Infirmary at Leeds, and he then served for more than four years in the R.A.M.C. (S.R.), retiring with the rank of captain. After a period as resident surgical officer to the Ashton-under-Lyne Infirmary he started practice in Cumberland, and became honorary surgeon to the Whitehaven and West Cumberland Infirmary in 1925.

Major-General WALTER DREW MCCAW, C.B., former assistant surgeon general of the United States Army and chief surgeon of the American Expeditionary Forces, died at Kingston, New York, on July 7, aged 76.

The Services

NAVAL MEDICAL COMPASSIONATE FUND

At the quarterly meeting of the directors of the Naval Medical Compassionate Fund, held on July 14, with Surgeon Rear-Admiral C. V. Griffiths, Deputy Medical Director-General of the Navy, in the chair, the sum of £66 10s. was distributed among the several applicants.

DEATHS IN THE SERVICES

Lieutenant-Colonel FREDERICK JOSEPH DEWES, I.M.S. (ret.), died in a nursing home at Blackheath on July 13, aged 78. He was born on January 3, 1861, the son of Mr. Henry Dewes, was educated at St. Thomas's Hospital, and took the M.R.C.S., L.R.C.P. in 1886. He entered the Indian Medical Service as surgeon on October 1, 1887, became lieutenant-colonel after twenty years' service, and retired on September 12, 1921. He served in Burma in 1884–8, receiving the frontier medal with a clasp; in the Chin Lushai campaign on the North-East Frontier of India in 1889–90, clasp to the frontier medal; in the campaign on the North-West Frontier in 1897–8, in the Mohmand expedition, receiving the medal with a clasp; and in Tirah, another clasp. He received the Kaisar-i-Hind Medal on January 1, 1909. He had been a member of the British Medical Association for forty-nine years.

Lieutenant-Colonel NORMAN ROBINSON JONES RAINIER, I.M.S. (ret.), died at Crowborough on July 12, aged 68. He was born on April 16, 1871, the son of Captain John B. Hainault-Rainier of the 14th Foot, and of Landport, Hampshire, was educated at Charing Cross Hospital, and took the M.R.C.S., L.R.C.P. in 1893. He entered the Indian Medical Service as surgeon lieutenant on January 29, 1896, became lieutenant-colonel on July 24, 1915, and retired on July 1, 1923.

Medical Notes in Parliament

Both Houses of Parliament will probably adjourn on August 4 for the Summer Recess. The remaining stages of the Criminal Justice Bill in the House of Commons will be postponed until the autumn sittings.

Amended Regulations for National Health Insurance Medical Benefit were laid on the Table of the House of Commons on July 25.

Milk Bill

The Earl of FEVERSHAM moved the second reading of the Milk Marketing Bill in the House of Lords on July 21, and summarized its proposals, as already expounded in the House of Commons. The EARL OF ONSLOW, as Chairman of Committees, pointed out that on an assurance by Lord Halifax that the Government would deal with pasteurization of milk by a general Bill, Glasgow had dropped a private Bill on the subject and Poole a clause in a private Bill. Since then the Milk Bill, introduced in the House of Commons and including provision for pasteurization, had been dropped. What attitude would the Government take if next session some local authority deposited a Bill similar to the Poole and Glasgow Bills? Lord SNELL said he felt it would be a long time before the public was convinced that milk was as safe as its food value was undoubted.

The Marquess of CREWE said the fear of tuberculous disease was widespread, and had been exaggerated almost to the point of belief that so long as any cattle were tuberculous the milk supply of the country was in danger. That was an exaggeration. Cattle might suffer from quite severe tuberculous lesions without affecting the purity of the milk.

Lord LUKE said the hospitals had suffered severely from the milk control schemes. The higher price they paid to-day for milk compared with 1932–3 before the milk control scheme came meant £115,000 more per annum for them. That calculation was based on the average price per gallon paid in 1932 against that in 1939, but hospitals used often to get special terms from friendly local suppliers of milk. A hospital of 500 beds required at least 100 gallons of milk a day.

At present prices one-quarter of the total cost of hospital provisions was for milk. Yet the quantity of milk supplied to hospitals was under a 150th part of the whole milk scheme. The British Hospitals Association put this dear milk matter to the Ministry two years ago, but the case was more urgent to-day. He did not ask for milk for hospitals at the low price which butter-makers paid, but the cost should at least be reduced to the price paid by hospitals before the milk control in 1933. Every penny of that extra £115,000 had to be obtained from the threepences which were paid by working men and from the contributions of subscribers.

Replying to the debate, Lord FEVERSHAM said the accredited and T.T. milk put on the market to-day was 40 per cent. of the total. Attested herds produced over 50,000,000 gallons a year. The Minister of Agriculture was aware of the case made out for the hospitals. There was no more justification for the provision of milk at specially cheap rates with Exchequer assistance to hospitals than for such other essential requirements for hospitals as gas, coal, electricity, bedding, and medicine. That hospitals were doing beneficent work was surely no reason why producers of milk should give preferential treatment to the extent of selling milk to them at an unremunerative level. The Milk Marketing Board had already granted such concessions as it usefully could. Lord Luke had quoted the figure paid in 1932, but the milk industry was then near bankruptcy. Social grounds might suggest the need for a review of the maintenance and equipment of hospitals, but such a review should consider not only milk but also expenses in provision of other necessities for hospital maintenance. As regards pasteurization, he could give no statement of the Government's view on the general question, but so far as local authorities were concerned it was open to them to promote private Bills containing pasteurization proposals, and the Government would consider those provisions on their merits.

The Bill was read a second time and sent to a committee of the whole House.

Medical Services in the Highlands and Islands

The Earl of ELGIN AND KINCARDINE initiated a discussion in the House of Lords on July 13 on the report on the Highlands and Islands of Scotland by the Scottish Economic Committee. He said that during the past fifty-five years the population of the Highlands and Islands had diminished by one-third. After a discussion Lord ZETLAND said the Highland population fell from 388,876 in 1831 to 293,212 in 1931. Between 1921 and 1930 the rate of decline approached 7.5 per cent., but since 1931 this tendency had been arrested. The 1936 population was estimated by the Registrar-General to be 291,849. In many respects there had been improvements in the conditions of life of the people in the Highlands and Islands, and an immense improvement in thirty years in the housing of the Hebrides and the North-West of Scotland. Much had been done, and was being done, by Government assistance to improve medical facilities, and the Highlands and Islands (Medical Services) Fund now had an annual expenditure of over £100,000. Medical services were made available to those who could not otherwise afford to pay for them by subsidies to general practitioners, in return for which poorer patients received attendance at modified fees. In 1914 the number of nurses in the Highlands and Islands was 107, of whom only forty-seven were fully trained. Now the Fund subsidized 200 nurses, and of these 182 were fully trained. Full-time, highly qualified surgeons were stationed for operative and consultative work in Shetland, Orkney, Lewis, Caithness, Sutherland, and the Fort William area. In 1938 some thirty-four patients who required urgent treatment were taken by aeroplane ambulance from the Hebrides to Glasgow Infirmary with assistance by the Fund.

The debate concluded.

Evacuation of Civil Population

In the House of Lords on July 17 Lord PHILLIMORE called attention to the difficulties connected with the evacuation of the civil population in time of war. The Earl of MUNSTER said that the Government was arranging to ensure that 3,000,000 persons of the priority classes should be moved from what he might describe as the battle zone to less vulnerable areas. The Minister of Health was discussing with the associations of local authorities the regulations to be made with regard to compulsory billeting. He proposed to set up small tribunals, which would be localized and have full knowledge of local conditions. It was not the intention to impose any general ban on the movement of private cars at the beginning of an emergency, but persons transporting themselves and their children out of vulnerable areas must not, of course, interfere with the official evacuation plan. The Commissioner of Police was making arrangements to minimize the possibility of chaos on the roads leading out of large towns and cities. It was the intention that the majority of those evacuated should use the train services, and arrangements had already been made with the four main-line railway companies and the Passenger Transport Board. Tenders had been issued for beds, and the greater number of blankets required had been obtained and were in the course of distribution to local authorities.

Dental Board's New Chairman

In replies on July 17 to Sir Francis Fremantle and Captain Elliston, Earl WINTERTON said Mr. E. L. Sheridan had accepted Lord Runciman's invitation to succeed the late Sir Francis Acland as chairman of the Dental Board of the United Kingdom. Mr. Sheridan, who had been a member of that board for many years, was last re-elected by qualified dentists practising in Ireland, which expression under the Dentists Acts meant the whole of Ireland inclusive of Northern Ireland. At the date of Mr. Sheridan's election the numbers of qualified dentists on the United Kingdom *Register* practising in Eire and in Northern Ireland were approximately 161 and 285 respectively. Mr. Sheridan's election was unopposed. The existence of a dental board in Eire did not seem to Lord Runciman to be relevant to the question of the appointment of the chairman of the Dental Board of the United Kingdom, one of the members of which must, under the provisions of the Dentists Acts, be elected by qualified dentists practising in Ireland.

Captain Elliston's question brought out the fact that Mr. Sheridan was a practitioner in the Irish Free State.

Treatment of Insured Persons with Sulphonamides

Dr. EDITH SUMMERSKILL asked Dr. Elliot on July 20 to state the chief considerations which led him to refuse to allow the drug known as M & B 693 to be generally used by medical practitioners for patients treated under the National Health Insurance Acts. Dr. ELLIOT, in reply, denied that he had refused to allow M & B 693 to be used for the treatment of insured persons. Insured persons, he said, were entitled to this remedy in all cases in which practitioners responsible for their treatment considered it advisable. Prescriptions for M & B 693 had been given to insured persons ever since the drug came into use. He greatly deprecated the suggestion that permission to use this remedy had been refused, as it might lead to medical practitioners withholding it in cases where it would be of use. The suggestion might thus prejudice the chances of recovery of insured patients. No possible question as to accounting could arise save in the small number of cases where the doctor received a capitation fee for dispensing drugs himself. Then, if he considered that the cost of using this remedy was more than should be borne by his capitation fee receipts, he could apply to the Minister for sanction for a special payment. This had been allowed in a number of cases.

Dr. SUMMERSKILL, in a supplementary question, asserted that Dr. Elliot was asked if he would put this on the special list of expensive drugs by the committee which dealt with this matter for national health insurance, and had said that he could not allow this, but that in a year's time, when the price of the drug was reduced, he would reconsider it. Dr. ELLIOT replied that Dr. Summerskill had no right to say so. This drug was available, always had been available, and always

would be available for insured persons. Suggestions that it was not were totally unfounded and dangerous to the health of the insured public.

Dr. SUMMERSKILL asked Dr. Elliot whether he did not refuse to put this drug on the special list at the request of the British Medical Association. She said, further, that the current issue of the *British Medical Journal* contained a statement that he had refused to put it on the special list but would reconsider the decision in a year. Dr. ELLIOT answered that he had refused to put the drug on the special list because it was obtainable under the ordinary arrangements for insured persons. This was a matter of accountancy, and the suggestion that it was being withheld from insured persons was unworthy of the medical profession.

Dr. SUMMERSKILL then asked whether Dr. Elliot knew that manufacturing chemists possessed a monopoly of certain drugs, and by charging prohibitive prices prevented poor patients from receiving the most modern treatment; and whether, in the interests of the community, he would take steps to remedy this. Dr. ELLIOT said that if given particulars he would look into the matter. Dr. SUMMERSKILL said the drug she had in mind was M & B 693, which was being sold in the market at 7s. 6d. for twenty-five tablets, and that because he refused to put it on the special list it was being sold at a prohibitive price. Dr. ELLIOT said he was willing to consider the question of this drug, but the actual cost of it was 4d. a dose.

Silicosis in South Wales

On July 18 Mr. J. GRIFFITHS asked the Home Secretary the number of applications received and the number of certificates granted for total and partial disablement, and certificates that death was due to silicosis among coal-miners in the United Kingdom in the eighteen months ended to the last convenient date, under the Various Industries (Silicosis) Schemes. Mr. PEAKE, in reply, circulated the following table:

Applications to the Medical Board for Certificates under the Various Industries (Silicosis) Schemes from Coal-miners

	Total	South Wales excluding Anthracite Mines	Anthracite Mines
Disablement or Suspension :			
Applications for certificates ..	1,306	521	470
Certificates granted	678	275	324
Certificates refused	628	246	146
Deaths :			
Applications for certificates ..	173	89	48
Certified as due to the disease	109	53	28
Certificates refused	64	36	20

Working Hours of Juveniles

When the House of Commons went into committee on the Civil Estimates on July 21 Mr. RIDLEY moved a reduction of the vote and opened a debate on the hours of juvenile labour. He said that by regulation the Home Secretary had authorized an eight-hour working day for 38,000 children of 14 and 15. Sir CYRIL ENTWISTLE said a committee had found that such hours would not be injurious to young people in the cotton industry and that the work would train them for adult employment. Mr. TOMLINSON protested against the regulation, but said that at the inquiry two doctors said the hours would not be prejudicial to the health of the children.

Mr. PEAKE said the Government was sympathetic to the claims of juvenile workers. Certain industries had used their rights under the 1937 Factories Act to claim exemption under Section 71 in regard to the employment of young persons for forty-eight hours a week. About sixty applications had been made by bodies in respect of distinguishable industries. In seventeen applications a prima facie case had been or would be made out, and an inquiry had been held or would be held. In five cases the Court of Inquiry had recommended that regulations should not be made. In three cases regulations had been recommended and issued in draft. These regulations provided that the forty-eight hours should only apply to those children who had reached 15 years, except that those at present employed should continue at the present hours. Regulations would shortly be issued in draft making the same provision on hours in the textile bleaching and dyeing industry, but in printing and bookbinding the recommendation was forty-five hours in place of forty-four for all juveniles under 16. No further inquiries could be ordered because the date for making applications had gone by.

Mr. Ridley's motion to reduce the vote was defeated.

Blood Transfusion Services

Captain PLUGGE asked on July 20 whether, when the first supplies of transfused blood were exhausted, additional supplies would be obtained on a similar system of bulk collection, or whether those registering for transmission would be required to travel to different parts of the Metropolis or the provinces for the purpose of blood transfusion. Dr. ELLIOT replied that the arrangements now being made were for selecting and registering donors of blood. These volunteers would not be asked to give any blood unless and until an emergency arose. Their services would be required at the places where they registered, or, if they had moved, at the nearest hospital where the blood is being collected. Answering a further question by Mr. Mander, Dr. ELLIOT said he hoped to give some financial assistance, where necessary, towards the work of testing and registering blood donors in some of the main centres in the provinces. Forms and other registration documents similar to those used under the arrangements for London would be made available for the provinces.

Stamp Book Advertisement of Proprietary Remedy

On July 24 Sir ARNOLD WILSON asked the Postmaster-General how many stamp booklets had been issued, or prepared for issue, containing an advertisement of a proprietary medicine which promised immediate results to sufferers from rheumatism, backache, painful joints, and affections of the kidney, bladder, and prostate gland; on what date the existing contract for this advertisement would terminate; and whether his Department had sought any expert advice on whether or not it was in conformity with the restrictions proposed by the Select Committee of 1912.

Major TRYON said that 10,500,000 stamp booklets had been issued. There was no standing contract for the advertisement referred to, and his Department had not sought expert advice. Advertisements which specifically purported to cure any of the diseases mentioned in paragraph 58 (2) of the Select Committee's report were rejected. He was looking further into the policy of the Post Office in this matter.

Notes in Brief

Militiamen will not be compulsorily inoculated or vaccinated.

The number of insured persons in England and Wales who have been in receipt of sickness and disablement benefit continuously for a year or more is estimated to be approximately 250,000, of whom 150,000 are men and 100,000 are women.

One and a half million francs was voted by the League Assembly last September for anti-epidemic work in China during the current year. The question of the allocation for next year will be raised during the Assembly in September. The British Government recognizes the value of the League's anti-epidemic work in China, but its attitude must await the discussions of this matter at the Assembly meeting.

The number of men in Great Britain entitled to national health insurance benefit on December 31, 1938, was approximately 13,573,000, and the number of women 6,704,000. In addition, approximately 450,000 boys and 400,000 girls were entitled to medical benefit.

Medical News

The annual dinner of the old students of Westminster Hospital will be held at the Trocadero Restaurant, Piccadilly, W., on Saturday, September 30, when the senior physician of the hospital, Dr. Hildred Carlill, will be in the chair. The inaugural address will be delivered in the Sir Edward Meyerstein Lecture Theatre of the Medical School on Monday, October 2, at 3 p.m., by Lord Burghley.

The sixth congress of the Societas Oto-Rhino-Laryngologica Latina will be held at Utrecht from August 28 to 31, under the presidency of Professor Quix. The subjects for discussion will be the anatomy, physiology, and clinical aspects of the vestibular labyrinth and sulphonamide in oto-rhino-laryngology. Further information can be obtained from the general secretary, Dr. Chavanne, 5, Place des Cordeliers, Lyons.

The third International Neurological Congress will be held in Copenhagen from Monday, August 21, to Friday, August 25, at the university. The main topics for discussion are the endocrine-vegetative system, with special reference to neurology; the heredo-familial diseases, especially from the genetic aspect: and neurological aspects of the avitaminoses, with special reference to the peripheral nervous system. The rapporteurs from Britain are Sir Henry Dale, Sir Edward Mellanby, and Dr. C. C. Ungley. The official opening of the congress will take place in the presence of the King of Denmark and Iceland, and the Corporation of Copenhagen is giving a banquet at the Town Hall. A number of excursions and visits to places of interest have been arranged. All neurologists, neurosurgeons, psychiatrists, and any physicians or surgeons interested in neurology may become active members of the congress, applying either direct to the secretary-general, Dr. Knud H. Krabbe, Kommunechospitalet, Copenhagen, K., or through one of the national committees. The chairman of the British National Committee is Dr. Wilfred Harris, and the secretary and treasurer Dr. Macdonald Critchley, 137, Harley Street, London, W.1.

The American Association of Biophysics and Cosmobiology is organizing an international congress of biophysics, biocosmics, and biocrasy, to be held at New York from September 11 to 17 under the honorary presidency of Professors D'Arsonval, Branly, Langevin, and Tchijeskvy. Further information can be obtained from the general secretary, 39, Rue Scheffer, Paris, XVI.

The fifteenth congress of the German Pharmacological Society will be held at Cologne from September 12 to 15, and the congress of the German Physiological Society at Munich, under the presidency of Professor Broemsh, from September 14 to 16.

The annual meeting of the Canadian Tuberculosis Association will be held at the Royal Alexandra Hotel, Winnipeg, on September 7, 8, and 9. Various phases of tuberculosis work will be covered by authoritative speakers, including many leading Canadian physicians, and the following speakers from other countries: Dr. Erik Hedvall, director of the University Tuberculosis Clinic, University of Lund, Sweden; Dr. J. A. Myers, professor of preventive medicine, University of Minnesota, and past-president, National Tuberculosis Association; Dr. Thomas J. Kinsella of Minneapolis, chest surgeon to Glen Lake Sanatorium; Mr. W. P. Shahan, executive secretary, Illinois Tuberculosis Association: Dr. J. H. Harley Williams, general secretary, National Association for the Prevention of Tuberculosis of Great Britain. Among the leading topics will be: epidemiology of tuberculosis, case-finding methods, treatment of tuberculosis, non-pulmonary tuberculosis and non-tuberculous pulmonary conditions, and a symposium on Indian tuberculosis.

An international balneological postgraduate course will be held at Budapest from October 2 to 8. Further information can be obtained from Zentralkomite für das ärztliche. Fortbildungswesen, Eszterhazy-utca 9, Budapest, VIII.

The council of the Royal Society of Medicine at its last meeting made the ninth award of the William Gibson research scholarship for medical women to Miss Diana Kinloch Beck of the Radcliffe Infirmary, Oxford, for her proposed research on the cerebral vascular system in relation to cerebral aneurysms and their surgical treatment.

The National Radium Trust met on July 24 at the Privy Council Office, Lord Runciman, Lord President of the Council, presiding. The Trust made appointments to the Radium Commission, which allocates the Trust's radium to radium centres and supervises it in use, and considered questions arising out of the Cancer Act, 1939. Mr. E. S. Hill was appointed secretary of the Trust in place of Mr. R. Stanton, who has resigned on account of his promotion in the Ministry of Health.

Sir John Russell, Director of the Rothamsted Experimental Station, in an address on the trend of progress in agriculture at a recent conference of the Society of Chemical Industry, said that some people went so far as to claim that crops grown with inorganic fertilizers were themselves unhealthy, were unwholesome for human beings and for animals, and conduced to disease, while if grown with organic manures they remained healthy and health-giving. "No evidence is offered, nor do I know of any. All available evidence goes to show that the large crops grown with suitable fertilizer mixtures are at least as healthy and as nutritive as any others."

The German Society for the History of Medicine, Natural Science, and Technique will be held this year in Jena from September 21 to 24, when the chief subject for discussion will be "The Eye in the History of Medicine, Natural Science, and Technique." There will also be an exhibition of historical collections in Jena and Weimar.

The forty-fourth Annual Convention of the American Academy of Ophthalmology and Oto-laryngology will be held in Chicago from October 8 to 13, at the Palmar House, under the presidency of Dr. George M. Coates, Philadelphia. The academy has a membership of about 2,800 eye, ear, nose, and throat specialists, and its headquarters are at 1500 Medical Arts Building, Omaha, Nebraska. About half the programme for the convention is devoted to formal addresses, but fully half the week's activities consist of "instructional courses."

Dr. Noel Fiessinger, professor of experimental pathology in the Paris Faculty, and co-editor with his father, Dr. Charles Fiessinger, of the *Journal des Praticiens*, has been nominated professor of clinical medicine in succession to Professor Carnot, who is retiring on reaching the age limit.

Dr. William E. Thompson of Bethel, Ohio, the oldest practising physician in the United States of America, celebrated his 104th birthday on July 6.

Major T. C. McKenzie, M.B., has been appointed a Deputy Lieutenant for the County of Stafford.

Dr. James Bryan Herrick, emeritus professor of medicine at Rush Medical College, Chicago, has received the American Medical Association's second annual award for distinguished service to medicine.

Dr. Laignel-Lavastine, professor of the history of medicine in the Paris Faculty, has been elected president of the International Society of the History of Medicine.

Professor Luigo D'Amato, director of the Medical Clinic of Naples University, has been made a senator of Italy.

Dr. Thierry de Martel, the well-known neurological surgeon of Paris, has been made a Grand Officer of the Legion of Honour.

Three new chairs for the history of medicine have been founded in Italy—at Florence, Turin, and Sienna.

The centenary of the foundation of the first military hospital in Serbia and the thirtieth anniversary of the Belgrade Military Hospital have recently been celebrated at Belgrade.

Immunization against diphtheria with anatoxin has recently been made compulsory in Italy for children between 2 and 10 years.

No. 28

INFECTIOUS DISEASES AND VITAL STATISTICS

We print below a summary of Infectious Diseases and Vital Statistics in the British Isles during the week ended July 15, 1939.

Figures of Principal Notifiable Diseases for the week and those for the corresponding week last year, for : (a) England and Wales (London included). (b) London (administrative county). (c) Scotland. (d) Eire. (e) Northern Ireland. Median values for the last 9 years for (a) and (b).

Figures of Births and Deaths, and of Deaths recorded under each infectious disease, are for : (a) The 126 great towns in England and Wales (including London). (b) London (administrative county). (c) The 16 principal towns in Scotland. (d) The 13 principal towns in Eire. (e) The 10 principal towns in Northern Ireland.

A dash — denotes no cases ; a blank space denotes disease not notifiable or no return available.

Disease	1939					1938 (Corresponding Week)					1930-8 (Median Value Corresponding Weeks)	
	(a)	(b)	(c)	(d)	(e)	(a)	(b)	(c)	(d)	(e)	(a)	(b)
Cerebrospinal fever	33	4	8		2	20	2	9	2	—		
Deaths		—	—				—	—				
Diphtheria	836	85	149	23	19	1,075	153	121	58	24	912	153
Deaths	9	—	3	—	1	26	3	2	4	—		
Dysentery	32	10	27		—	39	16	25		—		
Deaths				—	—				—	—		
Encephalitis lethargica, acute	1	—	1		—	3	—	—		—		
Deaths		1					—					
Enteric (typhoid and paratyphoid) fever	23	1	7	13	—	26	5	3	1	2	51	
Deaths	—	—	—	—	—	2	—	—	—	—		
Erysipelas		34	57	2	4			58	9	1		
Deaths		1					1					
Infective enteritis or diarrhoea under 2 years												
Deaths	26	9	3	3	6	61	17	14	5	—		
Measles		32	65		3			109		4		
Deaths	4	—	—	3	—	5	1	1	—	2		
Ophthalmia neonatorum	112	13	33		—	94	12	39		—		
Deaths												
Pneumonia, influenzal*	508	40	5	1	5	528	37	9	1	8	528	41
Deaths (from influenza)	5	1	—	—	—	23	1	3	—	1		
Pneumonia, primary			136	11				143	13			
Deaths		5		8	4		11		13	8		
Polio-encephalitis, acute	—	—				1	—					
Deaths		—					—					
Poliomyelitis, acute	16	5	1		—	8	1	3		—		
Deaths		—					—					
Puerperal fever	4	4	8		—	6	6	7		1		
Deaths		2					—†					
Puerperal pyrexia	188	14	23		2	195	22	13		—		
Deaths												
Relapsing fever	—	—			—	—	—			—		
Deaths												
Scarlet fever	1,838	181	179	44	56	1,740	168	310	73	56	1,673	225
Deaths	2	—	—	—	—	3	—	1	—	—		
Small-pox	—	—	—		—	—	—	—		—		
Deaths	—	—		—	—	—	—		—	—		
Typhus fever	—	—	—	—	—	—	—	—	—	—		
Deaths				—	—				—	—		
Whooping-cough		249	36		5			25		3		
Deaths	14	3	5	1	—	6	2	1	1	—		
Deaths (0-1 year)	266	36	56	24	14	290	44	42	15	24		
Infant mortality rate (per 1,000 live births)	42	32				48	36					
Deaths (excluding stillbirths)	3,808	702	485	168	111	3,856	686	553	152	121		
Annual death rate (per 1,000 persons living)	9.3	9.0	9.8	11.3	9.7	9.5	8.7	11.3	10.2	10.7		
Live births	6,468	1,082	913	414	216	6,907	1,285	876	430	229		
Annual rate per 1,000 persons living	15.9	13.9	18.5	27.8	19.0	17.0	16.4	17.8	29.1	20.3		
Stillbirths	245	41	36			254	32					
Rate per 1,000 total births (including stillborn)	37	31	38			35	24					

* Includes primary form in figures for England and Wales, London (administrative county), and Northern Ireland.
† Death from puerperal sepsis.

EPIDEMIOLOGICAL NOTES

Infectious Diseases for the Week

Notifications of diphtheria declined during the week in each of the areas for which returns were made, with the exception of Northern Ireland, where the number increased from 8 to 19. The urban districts were responsible for the increased incidence shown by a few counties; Manchester, Sunderland, and Middlesbrough had 26, 17, and 17 cases, respectively, as compared with 18, 5, and 1 for the previous week. A slight reduction occurred in the cases of scarlet fever, but for England the number—1,838—was considerably above the median value—1,673—of the last nine years; several counties returned a larger number than in the previous week, Worcestershire with 39 cases against 15 of the week before having the largest relative increase, while Lancashire showed a considerable decrease, from 306 to 241 cases. An increase of measles was notified in the sixteen principal towns of Scotland, but the cases, 65, were only slightly more than half as numerous as those in the corresponding week last year—109. Dysentery and enteric fever declined in England but increased in Scotland. Influenzal pneumonia increased, but the number of cases notified is below the average number for the last nine years. Ophthalmia neonatorum has also shown a rise in incidence, the number of cases reported being the largest for the last five weeks. The number of cases of poliomyelitis in England had increased by 1. Cases have been reported from nine counties, London with 5, Kent with 3, and Warwickshire with 2 being the only counties with multiple cases. The 3 cases in Kent are all from Canterbury; the London cases are from the boroughs of Camberwell 1, Southwark 2, and Wandsworth 2. The wide area over which the cases are scattered, with a concentration at London and the Home Counties, is similar to that at the start of last year's severe epidemic.

Cerebrospinal Meningitis in 1939

Details given in the *Weekly Epidemiological Record* of the Health Section of the League of Nations show that the only epidemic of importance in Europe occurred in Germany. The cases of cerebrospinal meningitis appear to have increased considerably during the six months ended June 24, 4,174 cases being reported as compared with 1,008 during the corresponding period of 1938, and 999 during that of 1937. The number of cases reported in England during the first six months of 1939 was 853, compared with 782 in 1938; the corresponding figures for Scotland were 265 and 251. Hungary showed a relatively large increase, 197 cases being recorded in the first half of 1939, as against 42 in the corresponding period of 1938. Not more than 10 cases a month were recorded during the first half of 1939 in Denmark, Sweden, and Rumania. Epidemics occurred in Anglo-Egyptian Sudan and in French West Africa; the numbers of cases reported in the first six months of 1939 were 1,657 and 8,361, respectively, as compared with 221 and 4,757 in the first half of 1938; their maxima occurred in March.

Acute Poliomyelitis in 1938-9

A survey of poliomyelitis in 1938 and the early months of 1939 is made in the current *Weekly Epidemiological Record* of the Health Section of the League of Nations. In England and Wales, in which the incidence of the disease was above that for the seven preceding years, the largest number of cases was reported in Essex, Sussex, London, and Glamorgan. In the first six four-week periods in 1939 the notifications were above the median value of the corresponding period of the years 1927–37. In Germany, where the disease was also more prevalent than in the preceding seven years, the bulk of the cases occurred in Rhenish Prussia, in Bavaria, in Baden, and in Württemberg. Of the 5,747 (517) cases recorded during the year, 2,504 (229) were in Prussia, 950 (104) in Bavaria, 992 (71) in Württemberg, 502 (63) in Saxony, 350 in Baden, and 136 in the Saar. The figures in parentheses here denote deaths. In France, 439 cases were reported from the beginning of September to the end of November, 1938, in the department of the Rhone 37, in the departments of the Côte d'Or and Nord 35, and 30 in the department of the Seine. In the United States the incidence was well below the median value for the previous eleven years and much below the figures recorded for 1937. This favourable situation continued during the first five months of the present year, with the single exception of South Carolina, where 71 occurred in the four-week period ended June 10, exactly the same as in the immediately preceding four-week period.

Letters, Notes, and Answers

All communications in regard to editorial business should be addressed to THE EDITOR, BRITISH MEDICAL JOURNAL, B.M.A. HOUSE, TAVISTOCK SQUARE, W.C.1.

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QUERIES AND ANSWERS

Birth Fracture of Tibia

MR. IAN FRASER (Belfast) writes: The so-called birth fracture of the tibia is a rare condition, but when it occurs it presents a serious and difficult problem. It is scarcely mentioned in the textbooks. I have a case under my care at the moment, and, as is usual in very difficult cases, it is in the child of a close personal friend. Fortunately these cases occur only rarely in any one man's experience, and I should like to know what views are held upon them as regards both causation and treatment. "Birth fracture" is an unfortunate term, and sometimes is the cause of casting undeserved reflection upon the accoucheur. In one medical school in England the procedure is to keep the child in plaster-of-Paris for many years, and when a stump sufficient to carry an artificial limb has formed an amputation is carried out. This surely is an admission of defeat. Few of us would have the courage to tell the parents of an only child, who had already lost their firstborn, that an amputation is the best that can be done. The problems are many. What is the cause? When does the fracture occur? Is the fibula usually involved—or if it is left intact does it hinder union of the tibia? What are the chances of a bone graft? What is the optimum age? How often can this be repeated? (I saw one recently which had been grafted six times.) The gravity of this problem is not realized by the average doctor, and I should be most grateful for any help and suggestions.

Frigidity after Childbirth

"DOCTOR" writes: May I enlist the help of your readers in the treatment of a patient. She is in the middle twenties, and had a baby nearly a year ago, since when sexual desire has gradually diminished and at present is almost completely absent. Occasionally there is slight dyspareunia. Contraceptives are being used (chemical pessaries). The general health of the patient is fairly good, and there are no obvious worries.

Excessive Smoking

Dr. ARTHUR LAURIE (Glasgow) writes: About fourteen years ago I was advised to smoke a herbal mixture as a relief from asthmatic attacks. Since then I have not been able to smoke even a cigarette. The cure for smoking, though unsought, was devastatingly successful.

Income Tax

Profits Basis—Additional Assessment

"CASH" purchased an existing practice in 1935, but did not take over the book debts. He had previously been a member of a firm which was assessed on the cash basis, and at his request the income from the new practice was also assessed on that basis. The Revenue authorities are now claiming to increase the assessments for 1935–6 onwards to put them on the value-of-bookings basis.

*** It must be agreed that a practice should be assessed on the basis of the bookings (less an allowance for bad or doubtful debts) in such circumstances. If not, a full year's expenses are charged against something less than a year's gross earnings. The only chance "Cash" has of resisting the proposed increases is to contend that as the Revenue authorities knew the facts when the first assessments were made they cannot now increase them. The point is not beyond dispute legally, but in the circumstances the balance of opinion is probably against that contention. But it is perhaps worth trying.

Locum Work—whether Schedule D or Schedule E

"CH.B." was employed before her marriage as maternity and child welfare medical officer by a local authority. She resigned on marriage, but has since "taken locum consultations from time to time, earning £1 8s. per consultation at various child welfare clinics." Is she assessable under Schedule D or Schedule E?

*** The test is whether the fees are the result of an "employment"—if so, they are assessable under Schedule E. We assume that when earning the fee "Ch.B." is as much under the control of the local authority as when she was a medical officer in the ordinary way, and on that basis we should regard Schedule E as the correct schedule notwithstanding that the employment is part-time and is paid on the basis stated.

Motor-car Expense—Appointment

"R. H. C." is employed whole-time as a civil medical practitioner under the Air Ministry. He lives four and a half miles away from his work and does the return journey twice a day. He keeps a second car for the use of his family. Can he claim any relief for the car?

*** No. The expense of travelling between the place of residence and the place where the duties are performed has been held by the courts to be inadmissible for income tax purposes.

Sale of Practice—Cash Basis

"J. P." has been assessed for many years on the cash basis. He has sold his practice as from June 30, 1939, and the inspector of taxes has asked him for a copy of his accounts for the three months to that date, and has inquired whether he will be retaining the cash subsequently received for work he has done.

*** "J. P." should send in the three-months account on a cash basis, but he should not return for assessment cash received after June 30, 1939. That is in accordance with a well-established practice, where, as in this case, the gross cash receipts have been accepted as a measure of the gross earnings. (Possibly the inspector asked the question so that he may know how to deal with the liability of "J. P.'s" successor.)

LETTERS, NOTES, ETC.

Blood-grouping of the Population

Dr. J. NICHOLL (Lewes) writes: May I make a plea for a general grouping of all the population into their blood groups, so that in the event of hostilities it would be an easy matter to supply blood of a suitable group to the injured person. Also, it would be known where universal donors could be found quickly, or where universal donors could form a blood bank for general use. This would also be of value in cases of accidents, road or otherwise, or for any haemorrhagic emergencies. This could be arranged either by the people attending at a pathological laboratory of a large county hospital or by the county medical officers of health.

Blood Transfusion Service

Dr. G. A. POWELL-TUCK (Birmingham) writes: In view of the immediate national urgency for the enrolment of volunteers for the expansion of the blood transfusion services, may I suggest the possibility of a campaign being started by doctors to advise periodic bleeding of suitable cases of hypertension under their care, a measure which would be beneficial to the patient and of great value to the service.

Cod-liver Oil and Vitamin A Supplies

Mr. K. MACLENNAN, B.SC., general manager of British Cod Liver Oil Producers (Hull) Limited, writes: The widespread publicity which has been given to the discovery that livers of fish other than cod contain vitamin A in high concentration has created some confusion as to the relative contribution of vitamin values which arise from cod-liver oil and from other fish oils, typically halibut-liver oil. In your issue of June 24, for instance, Mr. J. I. M. Jones of British Colloids states that cod-liver oil has, since the discovery of these other fish oils, been "relegated to a considerably lower position in the nutritional hierarchy than it formerly held." Similarly, Professor Drummond in his recent book, *The Englishman's Food*, on page 180, makes similar statements, and particularly "it [halibut oil] has almost displaced cod-liver oil as a means of giving vitamins A and D." These statements are so very wide of the truth that they call for immediate and categorical contradiction: indeed, Mr. Jones in his anxiety to remove a minor arithmetical misapprehension appears to be anxious to create a still more erroneous one. Cod-liver oil still remains by far the largest and most significant additional supply of vitamin A available for human nutrition. Its consumption in this country to-day, for medicinal purposes alone, exceeds 2,000 tons per annum, a figure which is many times as great as the consumption of all other fish-liver oils and concentrates, both in tonnage and in vitamin A supplies. The cod fisheries of the world are so overwhelmingly large as compared with any other fisheries yielding oil rich in vitamin values that they form the only possible source of supply for anything approaching the extra vitamin A values that are now considered to be necessary in the national diet.

Treatment of Angioneurotic Oedema

Dr. A. FREITAG (London, S.E.25) writes: I have read with interest the letter from Dr. B. Kounine (July 22, p. 208) on the treatment of angioneurotic oedema. May I point out another treatment for the same condition which is much simpler and less expensive—namely, autohaemotherapy. I have never found it to fail. Only recently I had a case of a female, aged 22, who had been subject to attacks of urticaria and angioneurotic oedema since November 24, 1938. On May 19 I gave her an intramuscular injection of 10 c.cm. of blood withdrawn from the median basilic vein. I repeated this on May 26, and since then the patient has had no more attacks. The cost of the preparation suggested by Dr. Kounine is over £5, and if there is a simpler and cheaper treatment I think it deserves a trial.

A Scottish Pioneer in Photography

In a reprint from the *St. Andrews Times* of March 22, 1939, entitled "St. Andrews and the Centenary of Photography" Mr. William Mair describes the important part in the birth of the new art played by a young St. Andrews physician, Dr. John Adamson. In 1840 he succeeded in making the first "calotype" (as the earliest photographs in this country were called) ever produced in Scotland. Adamson shared his knowledge with his younger brother Robert, who, through the good offices of Sir David Brewster, the inventor of the kaleidoscope, at that time Principal of and Professor of Physics at St. Andrews University, became the technical assistant of another photographic pioneer, David Octavius Hill, a Scottish landscape painter. The collaboration of these two produced some remarkable work, culminating in an enormous picture, more than eleven feet high, depicting the "First General Assembly of the Free Church of Scotland: signing the Act of Separation and the Deed of Demission." With the exception of a few leading figures all the 500 individuals represented on this vast canvas were painted from calotype prints. Mr. Mair's reprint is illustrated by reproductions of several early photographs, including one of John Adamson.